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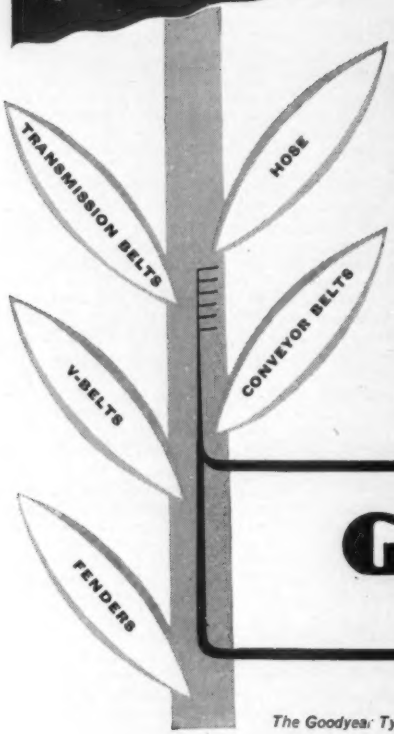

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IRON AND COAL
TRADES REVIEW

Vol. 180 February 19, 1960 No. 4,779

Coal Finance

COMPLAINT by Sir James Bowman of "irresponsible and tendentious suggestions" that the National Coal Board, in charge of a nationalized industry, lacks "financial discipline" comes at a time when another national board, in charge of the railways, shows itself to be financially in a very sorry state indeed. The Transport Commission's debt is £350,000,000, and there is a bill of many millions of pounds to come for the railwaymen's pay rises. The financial position of the railways will have to be straightened out, somehow. The strike by members of the National Union of Railwaymen was averted at the eleventh hour. Had it materialized the community would have paid dearly. But there is still a bill to meet, and whatever arrangements are ultimately made to meet the cost of the pay increases and put the finances of the commission on a different basis, somebody will have to pay.

No one can afford to take a detached view of the sick and sorry mess into which the railways have got themselves financially. As fare-paying passengers or as taxpayers—perhaps in both capacities—the public will in the end be required to dig deeper into its pockets. Industry in general is vitally concerned. Coal and steel, in particular, are big railway users, and cannot look with equanimity on the prospect of higher transport charges. Nor for that matter, can gas and electricity.

To describe the Transport Commission's finances as being in a chaotic state is a fair summary of the position. No such accusation has been directed at the National Coal Board, but there have been many calls on the board to put its financial house in order. Contributing to the Fuel Economy Review, published annually by the Federation of British Industries, Sir James Bowman denies that the board "lacks financial discipline." The financial principles and practices of the NCB are in line with the best that can be found anywhere, he states, whether the business is private or public. He also refutes the allegation that the coal industry since nationalization has involved the taxpayer in unending losses.

In point of fact, the coal industry's revenues have exceeded operating expenditure by a considerable margin. How is it, then, that the board has an accumulated deficit, rather than a surplus? Sir James provides the simple answer. When a private company has a trading surplus it disposes of part of the money by way of dividend. Because the NCB has no equity capital it cannot pay dividends. It has only loan capital, on which it pays interest. What therefore in normal private enterprise would appear mainly as "dividend," in the board's case appears as "interest payable to the Minister of Power," and absorbs the biggest part of the surplus —according to Sir James, some £220,000,000. There are also tax payments amounting to £10,000,000.

In discussing NCB finances, it is fair, too, to point out that the board bore the cost of bringing in coal from abroad during the period of acute shortage. Imported coal, although much more expensive than home coal, was sold at figures governed by the board's inland price structure. The difference in actual cost between imported coal and home prices amounted in all to nearly £75,000,000. Opinions differ on whether or not it was the right policy to cheapen imported coal so that it could be sold at the same price on the inland market as British coal. If it was the right policy, then the question arises as to whether or not any burden should have fallen on the board. "So far as the general public is concerned, since the board is not a private concern, it might be said that the matter is no more than one of administrative convenience. But it is not fair that, as a result, the board should be accused of financial improvidence or the industry should be accused of inefficiency," Sir James writes.

In 1958 and again in 1959, the National Coal Board more or less balanced its production costs and its proceeds. The financial costs of stocking coal put the board "in the red" in those two years. When destocking begins the board should be able to look forward to a financial gain, unless some external event, such as an increase in railway freight rates, intervenes. The board has overhauled its production plans and streamlined its organization generally, and is certainly in 1960 operating a more efficient industry than it did in 1957. As industry generally gains momentum it should benefit from the increased demand for energy which will surely follow, and because of its relative increase in efficiency it is in a better position to fight the competition from oil.

Critics of the board's financial policy might note that the price of coal—a vital factor in the make-up of any balance-sheet—has been stable since the middle of 1957. Oil prices, on the other hand, have been going up, and there appears to be a general expectation of more increases to come. It would need a lot of courage on the part of the National Coal Board to announce publicly that it will keep prices steady over a period of, say, 12 months ahead. There are many factors, not all of

them within the board's control, that could make such a promise very expensive. Such a declaration, however, would be a potent weapon in the battle for coal, since it is on decisions made now that the relative levels of coal and oil consumption a year or two ahead depend. The board would have a still more powerful weapon to wield, both at home and abroad, if it could point to the possibility of coal being cheapened in price. Perhaps that is too much to expect, but it would certainly have a profound effect on sales.

BILL TO AUTHORIZE LOANS FOR STEEL PROJECTS

PUBLISHED on Thursday of last week, the Iron and Steel (Financial Provisions) Bill will enable loans to be made from the Consolidated Fund of up to £50,000,000 to Colvilles, Limited, for the construction of a strip mill at Ravenscraig (Lanarkshire) and up to £70,000,000 to Richard Thomas & Baldwins, Limited, for the expansion of sheet steel capacity at its new Spencer Works, Llanwern, Newport (Mon).

The bulk of the expenditure is likely to fall in the next three years, although the companies can spread their drawings over the next five years. Issues from the Consolidated Fund (below the line) rather than out of voted money (above the line) are the most common method of financing Government loans which are expected to be serviced and repaid on commercial lines. For this purpose it will be necessary to amend Section 5 of the Iron and Steel Act.

To retain parliamentary control it is intended that the Treasury's power to borrow and to make issues from the Consolidated Fund should be limited to the specified total of £120,000,000 and should be subject to a time limit. This will be fixed as the end of March, 1965, by which date all advances under the loan agreements will have been made.

Atlas Copco's Staff Training Courses

TRAINING courses in the use and maintenance of mining equipment have been started by Atlas Copco (Great Britain), Limited, Hemel Hempstead (Herts). for the company's salesmen and maintenance staff. Practical instruction in dismantling, repair, and assembly of rock drills and mine loaders is backed up by theory lectures.

Special attention is being paid to drill steel grinding so that the salesmen can advise their customers on the best steel-sharpening methods for various types of rock. The lectures are being given, and the demonstrations supervised, by departmental heads from the British company and the Swedish parent organization, and instruction is supplemented by films and lantern slides.

By degrees all salesmen in the various divisions of the company will receive a course of instruction on the firm's latest products. This initial course will be followed next year by a short refresher course.

INCREASED MINIMUM rates of pay under the Tin Box Wages Council took effect this week. Wages rose by 3d. an hour for men and 2d. an hour for women with proportionate increases for younger workers.

Passing Thoughts . . .

COMPETE or die is industry's choice today. Price agreements are being abandoned, tariffs lowered, new processes introduced, amalgamations arranged, everywhere increasing competition. Competition is a welcome spur to endeavour, but its conditions are hard; it leaves no room for easy profits or wages, restrictive practices or obstruction of new methods. British industry could have no greater boost than would come from real willingness by employers and labour to join forces and work wholeheartedly for greater efficiency and so earn a better income than can ever be there to divide from the proceeds of internal strife. Thus, too, can the new competition be met in advance, for if competition comes first its lesson may be learned too late and with painful cost.—MR. J. S. HUTCHISON, chairman of the British Oxygen Company, Limited.

Many of my friends agree with me that a modern, clean coal mine is greatly to be preferred to the thousands of mass-produced houses which are now inevitable.—Letter in the Glasgow Herald.

I think it is time to give a lead to something which will eventually occur elsewhere. It is better for the suggestion to come from the employers than for the men to have to fight for it.—MR. H. E. POYSER, managing director of Wilson's Foundry & Engineering Company, Limited, Bishop Auckland, which is introducing a 40-hour week by a series of monthly reductions in working hours.

It is just no good trying to persuade the workers that they are groaning in poverty when their chief worry is to find somewhere to park their cars.—Sheffield Telegraph.

If we are to plan successfully for full employment, more investment, and higher productivity, we shall need to extend the public sector, including more public ownership, most obviously in the field of steel and road transport.—MR. HUGH GAITSKELL.

Mr. Gaitskell's weekend speech at Nottingham added little or nothing to what he said at the Labour Party conference last November about nationalization.—Glasgow Herald.

His [Mr. Gaitskell's] utterances on State ownership are imprecise and cryptic, since he is more anxious to stress what Labour would not nationalize than to make its positive intentions clear. Steel and road haulage remain on the list, but beyond that Mr. Gaitskell is obscure.—The Scotsman.

Times have changed and the Labour Party must change with it. That's all Mr. Gaitskell asks.—Sheffield Telegraph.

Another move in the National Coal Board's programme for safeguarding the future of the industry and the men who work in it is a new technical service introduced for industry. It may well result in firms burning less coal, "but," says a spokesman, "we are not likely to lose their custom to our competitors."—Industrial reporter of the Stoke-on-Trent Evening Sentinel.

You need only read Hansard or the Press and you would think that I and my colleagues on the board were a set of commercial nitwits.—SIR JAMES BOWMAN, *chairman of the National Coal Board, when he opened Brynlliw Colliery, near Swansea, last Friday.*

STEEL DELIVERIES

Post-recession Economic Barometer

WHEREAS deliveries of finished steel in many industries have not only shown full recovery after the recession, but are above the fourth quarter of 1957—the highest before the recession—it is all too obvious from the Iron and Steel Board's production statement for January that railways and marine engineering have a very long way to go before it can be said they are sharing to the same extent in the country's economic recovery.

By the fourth quarter of 1958 deliveries to the three industries mentioned had fallen by one third and since the end of 1958 the situation so far as coal mining is concerned has not changed. Deliveries to the railways dropped from 23,500 tons at the end of 1958 to 14,300 tons a year later, and to 10,400 tons at the end of last year. Shipbuilding shows a similar downward path—from 20,100 tons to 13,100 tons and 11,600 tons.

Percentages of change over the past two years are even more revealing. Deliveries to railways have dropped by 55.7 per cent., to shipbuilding by 42.3 per cent., and to coal mining by 36.1 per cent. Bolts, nuts, rivets, etc., are down by 17.9 per cent., other home consumers by 12.8 per cent., and building and constructional engineering by 2.4 per cent., although in the last three cases, some improvement is now being shown.

Decline in Output of Rails

Outstanding improvements are shown in the cases of deliveries to motors, cycles, and aircraft (21.4 per cent.), hollow-ware (20 per cent.), stockholding merchants (19.3 per cent.). Other industries to have weathered the storm and to have improved on 1957 are metal furniture, windows, springs, etc. (9.5 per cent.), drop forgings, laminated springs, etc. (8.4 per cent.), general engineering (5 per cent.), and wire and wire manufacture (1.6 per cent.). Exports by producers, after dropping from 48,000 tons to 45,500 tons, have recovered to 52,000 tons (8.3 per cent.), but the heavy industries still depress the total deliveries from UK mills—326,900 tons in 1957, 258,400 tons in 1958, and 321,000 tons in 1959—to 1.8 per cent. below the 1957 figure.

So far as individual steel products are concerned, the heaviest decline has been in the output of rails. In the fourth quarter of last year it was little more than half that recorded during the last quarter of 1957. Production of plate was still about 18 per cent. below 1957 levels. The biggest swing in production has been in heavy rolled products which, after falling to nearly one half, is now almost back to pre-recession levels.

In contrast to these fluctuations the output of sheet was 22 per cent. higher than in the fourth quarter of 1957 and the output of tinplate made from strip was nearly 50 per cent. higher.

Of the expected increase in home steel demand during 1960, it is estimated that about half will come from increased consumption and half from a change from a running down to a building-up of producers' and consumers' stocks. Stocks at the end of 1959 showed little change in total compared with those at the end of the preceding quarter. Stocks held by the nationalized industries were lower, but stocks in the private sector were rising.

FBI Inquiry Reveals Optimism in Industry

A PICTURE of continued expansion and sustained optimism for the future is painted in the report of the seventh inquiry into industrial trends conducted by the Federation of British Industries. The report relates to the position at the beginning of February and is based on replies from 724 chairmen and managing directors of firms representative of British industry both in size and type. The main activity of 37 per cent. of these is in engineering, metals, shipbuilding, or electrical trades.

No less than 48 per cent. of the firms questioned felt more optimistic about the general business situation in the country than four months before when the last FBI inquiry was conducted. Only 3 per cent. felt less optimistic and the remaining 49 per cent. held the same views as before. Even so, a third of the firms found labour more difficult to get and only 7 per cent. reported an easing of the labour position. Slightly over half claimed to be working to capacity (the figure four months ago *was* 50 per cent.), but there remained 45 per cent. whose level of output was below capacity.

One outstanding feature of the inquiry was the upward trend in anticipated capital investment over the next year. In October, for the first time, the increase in future investment in plant and machinery outweighed the decreases and this trend has continued more strongly. The rising trend in capital investment intentions is confirmed by the replies to the question asking about orders received for capital equipment items.

Of the firms to which this question was relevant 48 per cent. reported an increase, 11 per cent. a decrease, and 40 per cent. no change. The upward balance here was nearly as marked as for new orders of all kinds.

Output trends, the rate of new orders, both home and export, and the length of order-books continue to rise more strongly than four months ago. Since then, 44 per cent. show an increase in the length of order-books, 13 per cent. a decrease, and 32 per cent. no change. In the case of 55 per cent. there was a rise in the rate of total new orders, but only 29 per cent. could say the same for new export orders. In this category, 44 per cent. reported no change, and 11 per cent. a drop.

More than half the firms questioned reported an increased level of output compared with four months previously, and 25 per cent. showed an increased level of export deliveries. In the case of 33 per cent. stocks of raw materials had risen; 20 per cent. showed an increase in stocks of finished goods, but 24 per cent. reported a decrease in this category.

West Midlands NCB Not Afraid of Oil

DETAILS of the National Coal Board's research into the development of smokeless domestic fuel were given to representatives of north Staffordshire, Cheshire, and Shropshire local authorities at a conference convened by the West Midlands Divisional Coal Board last week. Opening the conference, the divisional chairman, Mr. E. H. Browne, said: "All we ask is that as responsible people you would look at the facts—financial and otherwise—because we believe that we can give you smokeless heating in modern equipment in the most economical way."

Mr. Browne said the board was now erecting a pilot plant which, if all went well, would be a stepping stone to a large commercial plant for the manufacture of smokeless briquettes for domestic fires. When the fuel was available in bulk it would help local authorities to go ahead with the establishment of smoke-controlled areas.

The replacement of industrial or semi-industrial coal by anything else was unnecessary and usually uneconomic, but they did expect in time that house coal would be replaced increasingly by smokeless fuels. It would, however, be a gradual process.

In the coal industry they knew full well, he said, that oil was a serious competitor in some fields, but in the West Midlands there was still a wide price differential in favour of coal. "But we not only recognize oil competition—we are determined to challenge it." As well as improving efficiency and quality, a great effort was being made to strengthen technical and sales services.

Mr. R. A. Howson, marketing director of the divisional board, admitted that oil offered certain advantages over coal, but pointed out that in the Midlands coal was cheaper and for steam raising and space heating the best results in most parts of the country could be obtained by using it in modern, efficient equipment. The Government had indicated that coal must compete with other fuels and the consumer had the right to make his own choice. The coal industry was not afraid of oil competition on those terms. It was in good shape to meet the challenge and would continue to provide the bulk of the nation's energy requirements for many years ahead.

Asked how long it would be before the board could put on the market a smokeless fuel at the right price, Mr. Browne said it would be about three years, but some supplies would be available next winter for testing. Ald. Mrs. Annie Barker said she felt the board had lagged behind in the production of some coal that could be used domestically. The fact that they had only 78 smoke-control zones in the Midlands could be laid almost entirely at the door of the NCB, she declared.

Fees Under Open-cast Coal Act

COMING into operation on Monday, the Open-cast Coal (Fees) Regulations, 1960, require the National Coal Board to pay professional fees reasonably incurred by (*a*) any person to whom a copy of a record of condition of land is sent under section 36 of the Open-cast Coal Act, 1958, in obtaining advice or conducting negotiations with the board about that record, and (*b*) claimants in preparing their claims for compensation payable by the board under the Act.

The fees payable are subject to certain maxima.

Durham NCB Safety Campaign Pays Dividends

MEASURE of the success of the Durham Divisional Coal Board's campaign for greater safety is last year's total of fatal accidents—17—the lowest ever recorded in the division. This year, for the first time, there were two competitions—one based on the lowest accident rate per 100,000 manshifts (including all accidents causing more than three days' incapacity) and the other for the collieries showing the greatest reduction in accident rates during 1959, compared with the average for the two previous years.

Collieries in No. 1 (North-East Durham) Area and No. 5 (Mid-West Durham) Area each won three awards and shared another. The competitions are divided into three classes—"A" (large collieries), "B" (medium), and "C" (small). The results were as follow:—

DIVISIONAL FINALS.—Lowest accident rate: "A," 1 Harton, 2 Wearmouth; "B," 1 Washington Glebe, 2 Langley Park; "C," 1 North Tees, 2 Addison. Greatest improvement: "A," 1 Mainsforth, 2 Whitburn and Brancepeth (tie); "B," 1 South Pelaw, 2 Beamish Mary; "C," 1 Haggs Lane, 2 Phoenix Drift.

AREA FINALS.—Lowest accident rate: No. 1 (North-East Durham) Area, "A," 1 Harton, 2 Wearmouth; "B," 1 Washington Glebe, 2 Wardley. No. 2 (Mid-East Durham) Area: "A," 1 Murton, 2 Herrington; "B," 1 Lumley 6th, 2 South Hetton. No. 3 (South-East Durham) Area: "A," 1 Thornley, 2 Blackhall; "B," 1 Sherburn Hill, 2 Deaf Hill, No. 4 (South-West Durham) Area: "A," 1 Bowburn, 2 Fishburn; "B," 1 Chilton, 2 New Shildon; "C," 1 North Tees, 2 Randolph. No. 5 (Mid-East Durham) Area: "B," 1 Langley Park, 2 Pit House; "C," 1 Beamish 2nd, 2 Hole-in-the-Wall. No. 6 (North-West Durham) Area: "B," 1 Clara Vale, 2 Watergate; "C," 1 Addison, 2 Bradley Drift.

Greatest improvement.—No. 1 (North-East Durham) Area: "A," 1 Whitburn, 2 Harton; "B," Washington Glebe. No. 2 (Mid-East Durham) Area: "A," Harraton; "B," Lumley 6th. No. 3 (South-East Durham) Area: "A," 1 Horden, 2 Blackhall; "B," 1 Deaf Hill, 2 Sherburn Hill. No. 4 (South-West Durham) Area: "A," 1 Mainsforth, 2 Bowburn; "C," 1 Haggs Lane, 2 Tudhoe Mill. No. 5 (Mid-East Durham) Area: "B," 1 South Pelaw, 2 Beamish Mary; "C," 1 Stanley Cottage, 2 Brandon "C." No. 6 (North-West Durham) Area: "B," 1 Greenside, 2 Kibblesworth; "C," 1 Phoenix Drift, 2 Stanley Burn.

Shields will be awarded to the winners of the lowest accident rate competition, cups to the winners of the greatest improvement competition, and certificates to the runners-up in each section.

Recent Wills

ROBINSON, WILLIAM, founder of W. Robinson & Company, Limited, motor body builders, of Wolverhampton £57,696

BEAUMONT, L. M., chairman and managing director of Leonard Cooper, Limited, structural engineers, of Hunslet, Leeds £24,906

FRASER, J. N. M., chairman of Mappin & Webb, Limited, cutlery manufacturers, goldsmiths, silversmiths, etc., of London, W.1 ... ... £25,968

DAKIN, R. B., joint managing director and deputy chairman of Walter Somers, Limited, manufacturers of heavy steel forgings, etc., of Halesowen, near Birmingham £27,228

Welsh Pit Commissioned

BRYNLLIW COLLIERY COST £4,500,000

SPEAKING at the formal opening of Brynlliw Colliery, near Swansea, last Friday, the chairman of the National Coal Board, Sir James Bowman, congratulated the South-Western Division for its increased efficiency. Average shift output for each miner reached 20.3 cwt. in 1959, which was 5 per cent. more than the previous year. The division made its first profit of about £500,000. Brynlliw Colliery was closed for 30 years, but after extensive reconstruction it is now one of the most modern in the country.

Sir James, who unveiled a plaque to commemorate the commissioning of the new colliery, said that some of the old pits in the district were approaching the end of their useful working lives. He added: "But Brynlliw offers continuity of secure and worth-while employment. It is an object lesson in the way the mining industry is to modernize itself to survive."

The NCB chairman also defended the board's stockpile plan. He said the only alternative would have been widespread pit closures with hundreds of thousands of miners thrown out of work. The board had refused to create hardship and misery, which would have been intolerable and completely unjustified.

Cost of the New Colliery

Cost of the reorganization of Brynlliw Colliery is £4,500,000. A figure of £700,000 to £800,000 was inadvertently mentioned in this connection in a note on the opening in our last issue. Mining operations first began at Brynlliw in 1908 when two shafts were sunk to the Swansea Four Feet Seam at a depth of 340 yds. The Swansea Five Feet Seam, lying approximately 110 yds. below, was subsequently developed and both seams were worked until production ceased in 1925 due to a depression in trade. The colliery was abandoned in 1927. Before reconstruction began, the surface was derelict, equipment and sidings had been salvaged, and buildings were in a very poor state of repair. The initial work consisted of dismantling the old headgears, levelling the site, pulling down old buildings which were of no further use, and renovating those suitable for office accommodation.

The colliery is designed to produce 2,000 tons of saleable coal per day from reserves of low-volatile coal amounting to 40,000,000 tons in the Swansea Four Feet, Five Feet, Six Feet, and Three Feet Seams, all of which have been or are being worked in neighbouring collieries. The underground layout has been designed on semi-horizon mining principles, the underground roadways being driven at gradients suitable for the application of locomotive haulage.

AN AGREEMENT has been concluded between D. Napier & Son, Limited, aero and marine engineers, of London, W.3, and the Sierracin Corporation of Burbank, California, whereby the UK company has been granted exclusive rights to manufacture, use, and sell the "Sierracote" and "Sierraglo" processes in Britain and Europe. D. Napier & Son is a member of the English Electric Company, Limited, group.

Foundry Coke Merchants' Association Banquet

REPRESENTATIVES of many of the 90 member firms of the Foundry Coke Merchants' Association, who handle some 80 per cent. of the foundry coke trade, attended the association's 11th annual banquet at the May Fair Hotel, London, on Thursday of last week. The chairman, Mr. J. William Bell, presided and welcomed the guests.

Responding to the toast, Prof. J. White, Dyson Professor of Refractories Technology, University of Sheffield, and president of the Refractories Association of Great Britain, said it would be difficult to conceive of an industrial revolution without the development of methods for smelting pig-iron by means of coke. In the development of the foundry industry coke had become an essential industrial material. Output of oven coke had increased from 13,800,000 tons in 1947 to nearly 20,000,000 tons in 1958. Some 75 per cent. of that figure was used by the iron and steel and foundry industries.

Commenting on developments in the refractories industry, Prof. White said that no longer could they look forward to seeing furnaces in operation as they had done in the past. A careful watch was being kept on the introduction of oxygen in blast-furnace practice, its effect on refractory requirements and the efforts of the industry to meet those requirements.

Mr. Kenneth Marshall, director of the Joint Iron Council, proposing the toast of the association, said that last year the ironfounding industry had produced 3,500,000 tons of castings and had consumed 770,000 tons of coke at a cost of £8,750,000. He understood that 73 per cent. of the tonnage was transported by rail at a cost of some £6,000,000.

Other speakers included Sir Charles Fitton, vice-chairman of Parson & Crosland, Limited, iron and steel merchants and agents, of London, E.C.2, president of the Institute of Export, and chairman of the Pig-iron Merchants' Association.

A 60 PER CENT. INCREASE in the production of gearboxes last year, compared with 1958, is reported by the automobile division of David Brown, Limited. Orders totalling £70,000 have been placed by one commercial vehicle builder for model 552 which went into batch production four months ago. The addition of a new six-speed model to the commercial gearbox range is also announced with a first order for 100 units. With a choice of two sets of ratios it is suitable for a maximum vehicle loaded weight of 22 tons.

More Posts Filled at RTB Spencer Works

FIVE further senior appointments to the production and administration staff of the Spencer Works, now under construction at Llanwern, near Newport (Mon), are announced by Richard Thomas & Baldwins, Limited. They are Mr. Robert H. Parker as works manager, Mr. Henry F. Padbury as assistant works manager (coke, iron, and steel), Mr. Raymond Raby as coke ovens manager, Mr. O. W. Reynolds as education and training officer, and Mr. Simon I. Webber as assistant chief accountant.

Mr. Parker, who is 36, was born at Rotherham, and graduated at Manchester University with the degree of B.Sc. (Hons.). From 1940 to 1942 he was with the Appleby-Frodingham Steel Company (branch of the United Steel Companies, Limited). In 1949, after war service, he became a Lecturer in Metallurgy at the University College of Swansea. Three years later he joined the Guest, Keen Iron & Steel Company, Limited, at Cardiff as assistant chief metallurgist, and in 1955 was appointed assistant works manager. His committee work includes the South Wales Training Committee of the British Iron and Steel Federation.

Mr. Padbury is 46 and was born and educated in Leeds. He entered the iron and steel industry in 1931 as a metallurgical apprentice at the Grovesend Steel & Tinplate Company, and four years later joined the former Richard Thomas & Company, Limited, in the open-hearth department at the Redbourn works, Scunthorpe, becoming assistant manager of the department in 1937. In 1939 he moved to the Ebbw Vale works as assistant manager of the Bessemer plant, and was promoted manager of the department in 1945. He was appointed manager, steel and brickworks, at Ebbw Vale in 1958. Mr. Padbury is a member of the Steel Practice Committee of the British Iron and Steel Research Association.

The coke ovens manager, Mr. Raby, is 37. He joined Richard Thomas & Company, Limited, in its general offices at Redbourn in 1937. On demobilization from the RAF in 1946 he entered the coke ovens department, becoming coke ovens manager early in 1951. He has visited France, Germany, Holland, and the USA to study coal-carbonization practice.

Mr. Reynolds served as an engineering apprentice with a Bedford firm and then joined the Appleby-Frodingham Steel Company as apprentice supervisor. He was subsequently appointed assistant education officer. In 1953 Mr. Reynolds moved to the British Iron and Steel Federation as assistant area training officer for the West Riding and north Derbyshire district, becoming area training officer in 1955. He joined RTB in September, 1958, as education and training officer at the Redbourn section. He is 37.

A chartered accountant, and an associate of the Institute of Costs and Works Accountants, Mr. Webber received his early training in Glasgow and then spent three years as assistant to the secretary and accountant of a firm of Lancashire textile-machinery manufacturers. In 1954 he was appointed group cost accountant of Tillotson & Sons, Limited, Bolton, and in 1957 moved to Birmingham to join T.I. (Group Services), Limited, as its consultant accountant. Mr. Webber is 33.

FREDERICK BRABY & COMPANY, LIMITED—Mr. F. Heap and Mr. W. S. Lewis have retired from the board on reaching the retiring age of 70.

Hall-Thermotank Declares Forecast Dividend

FINAL dividend of 5½d. per 5s. share by Hall-Thermotank, Limited, engineering, refrigeration, and ventilation group, of Dartford (Kent), makes 6d. per share for the year ended September 30, 1959, as forecast, on an ordinary capital raised to £3,024,000 by acquisitions and a one-for-one scrip issue. Taking the scrip issue into account an equivalent payment was made for the previous year by J. & E. Hall, Limited, on £1,008,000 ordinary prior to the merger.

Consolidated profits for 1958-59, broadly the full year's results of J. & E. Hall and subsidiaries, plus three months' profits of both the Thermotank and Vent-Axia groups, totalled £930,416, and compares with those of £840,678 of J. & E. Hall previously.

The approximate group profit, before tax, for 1958-59 would have been £1,270,000, before charging expenses of forming the group, but after a full year's loan stock interest, had all the subsidiaries acquired after October 1, 1958, been subsidiaries for the whole year. After tax and charging group formation expenses, etc., the net balance is £262,237.

Home Machine-tool Orders Fluctuate

LATEST figures for machine-tool orders published by the Machine Tool Trades Association show that net new home orders during November, 1959, were £5,423,000, compared with £5,838,000 in October and £3,161,000 in November, 1958. Export orders rose to £2,927,000 (£2,473,000), compared with £2,140,000 in October.

Deliveries during the month dropped to £6,690,000, from £7,120,000 in October, and just on £7,000,000 in September. As a result the order-book at the end of the month showed a recovery. Home orders outstanding at the end of November, compared with the end of October, were £38,650,000 (£38,250,000) and export orders stood at £16,350,000 (£15,090,000).

Over the year there was a substantial recovery in new orders and deliveries, but the extra spurt in September was not maintained.

The recovery is still, for the most part, concentrated at the "quality" end of the trade, but the general undertone is firm.

TOP TRAWLER FITTED WITH HIGH-TENSILE WARPS

TRAWL warps of high-tensile strength were supplied by the Sheffield Wire Rope Company, Limited, a member of the Firth Cleveland group, to the Hull trawler Falstaff, which won the British Trawlers' Federation "Silver Cod" trophy for 1959. The Falstaff is the latest diesel-electric powered vessel in the Hull Distant Water Fleet.

Seven hundred fathoms of warp, with a greater breaking strength than the normal type, were used on each side of the trawl. The owners of the trawler, Hellyer Bros., Limited, reported that the rope had proved satisfactory throughout the 332 days which the Falstaff had spent at sea during 1959. The warp was supplied from the Hull depot of the company.

LANCASHIRE STEEL CORPORATION

£9,000,000 Expansion Scheme

DETAILS of a £9,000,000 expansion plan were announced at the annual meeting of the Lancashire Steel Corporation, Limited, on Thursday of last week. The company's second development programme was reported to be almost completed, and the new 1960-65 plan is designed to increase the company's steel ingot production to some 800,000-900,000 tons a year. The new scheme is still subject to planning permission from the Iron and Steel Board. Details were announced in the speech of the chairman, Sir John James, which was read in his absence (owing to the recent death of Lady James) by the vice-chairman, the Earl of Crawford.

A new rod and bar mill at the Irlam works is an immediate new project. The mill is designed to be in production in the spring or early summer of next year and it will go some way towards alleviating the shortage of rods which, completely reversing previous experience, has suddenly developed.

The increase in the production of steel ingots is being planned on a high use of hot metal in view of the scarcity of scrap. Ancillary to this is the building of the third open-hearth furnace outstanding from the 1953-58 plan, and it is hoped to obtain approval for the electric furnace which Sir John James mentioned in his review a year ago.

These developments completed, the Irlam site will be in use to the fullest extent this year, and Sir John says that efforts at this works must be concentrated on modernizing and increasing efficiency. At the Warrington works, the scheme provides for modernization of the three other bar mills during the next three years. The chairman says that the company's financial position is strong enough to enable completion of the programme from its own resources or with only some small assistance from bankers. At the end of the last financial year the company had net liquid assets of some £7,500,000, including about £3,500,000 in cash, Treasury bills, and gilt-edged stocks.

The chairman says he has every hope that the profit of approximately £3,480,000 for the year under review "will not long remain a record."

SIR RONALD MORISON NEW RAIL TRIBUNAL CHAIRMAN

SIR RONALD MORISON, QC, independent chairman of the British Iron and Steel Federation since 1955, has been appointed chairman of the Railway Staff National Tribunal, the arbitration body of the railway conciliation machinery. His appointment is in the first instance for one year.

Sir Ronald, who is 59, was called to the Scottish Bar in 1923 and to the English Bar in 1940. He was a member of the Industrial Disputes Tribunal from 1944 to 1954 and in the following year a deputy commissioner under the National Insurance Acts.

VACTRIC, LIMITED—Mr. A. J. Barsham has been appointed an additional director.

Head Wrightson's Agreement with New Jersey Firm

UNDER an agreement signed between Head Wrightson & Company, Limited, the Tees-side engineers, and the Belco division of the Bogue Electric Manufacturing Company, of Paterson, New Jersey, Head Wrightson will design, engineer, and build water treatment and trade waste disposal plants throughout the world, excluding the North American continent.

MR. E. P. SCHINMAN

Mr. Edward P. Schinman is president of the Bogue Electric Manufacturing Company. Belco is well established in this field, and by merging the resources of the two companies it will be possible to offer industry the services of an organization with both outstanding design experience and manufacturing technique, especially in the field of fully automatic processes.

Some of the largest demineralization plants in the world at chemical plants, oil refineries, and at nuclear stations had been installed by the American company. The existing interests of the Tees-side company in these fields will permit it to expand the services it now offers.

The design and manufacture of this equipment will be handled by Head Wrightson Processes, Limited, which has moved to 20-24, Old Street, London, E.C.1. The headquarters of this company, which is also responsible for all Head Wrightson's nuclear research and nuclear power interests will be located at Yarm-on-Tees. Additionally the company will continue to supply the industrial cooling equipment and the specialized chemical plants not covered by McKee Head Wrightson, Limited.

POLLARD BEARINGS, LIMITED—Mr. A. C. E. Musk (and not Mr. A. C. E. Marsh as previously stated) has joined the board.

Law Cases

NO CONTRIBUTORY NEGLIGENCE

DAMAGES totalling £1,319 were awarded at Monmouthshire Assizes to Mr. Frank Morris (60), a miner at Rose Heyworth Colliery, Abertillery, for injuries received when he was trapped under a fall of coal. The accident took place in the Black Vein Seam in November, 1956, when Mr. Morris's left hip was fractured.

For the plaintiff, Mr. E. Ryder Richardson, QC, said that when the face slipped Mr. Morris jumped to avoid the fall, but was tripped by an alignment cord between two posts and trapped by the fall. It was maintained that the face was not properly supported and that there should have been a line of support posts no more than 3 ft. from the face whereas they were, in fact, 6 ft. from the face, the Coal Board contending that closer supports would have fouled the plough.

Mr. P. J. Graham, QC, for the NCB, denied negligence and breach of statutory duty and alleged contributory negligence by Mr. Morris. Mr. Justice Davies, however, said: "There is not a shred of evidence here of any contributory negligence."

STOLEN SCRAP METAL

SENTENCE of 18 months' imprisonment was passed on Percy Gilliver (38), a Sheffield scrap dealer, at the adjourned West Riding Quarter Sessions. He was found Guilty on a charge of receiving stolen metal and Not Guilty on a charge of stealing 43 cast-iron railway track chairs valued at £30 and belonging to W. & F. Smith, Limited, iron and steel merchants, of Ecclesfield, Sheffield.

Prosecuting, Mr. D. M. Savill said that 8½ tons of cast-iron chairs had been taken into stock in June, 1959, but by September it was noticed that the stock had been seriously reduced. Samples of rust and soil taken from the stack and from cast-iron chairs found in a lorry outside Gilliver's house proved similar in all respects. For the defendant Mr. A. S. Palmer said that Gilliver had bought the metal from another man for £7. After doing so he went to see his mother and then parked the lorry outside his house.

WELSH COLLIER "SQUEEZED"

CWMTILLERY colliery worker, whose pelvis was fractured when he was "squeezed" between two trams underground, was awarded £862 14s. 4d. damages by Mr. Justice Arthian Davies at Monmouthshire Assizes. He was Mr. M. G. Dixon (42), who is now employed as a telephone operator at the pit.

The National Coal Board contended that Dixon should have used an alternative route to get to the pit bottom, but Dixon ruled out both the routes suggested because they were not "traversible with safety and reasonable convenience."

The judge said: "I am abundantly satisfied that however improper and however wrong the route taken was, it was habitually used by these men and in that way was permitted by the management." He was unable to find contributory negligence by Mr. Dixon.

METAL FIRM'S CAPITAL REDUCED

REDUCTION of the capital of William Morris & Son (Birmingham), Limited, metalworkers, was confirmed by Mr. Justice Buckley in the Chancery Division on Monday.

For the company, Mr. C. G. Heath said it had an authorized capital of £80,000, of which £64,000 was paid up. It was proposed to return £32,000 to shareholders as being in excess of the company's requirements, and it was proposed then to increase the capital to £80,000 again. Mr. Heath said that annual profits had grown from £2,904 to more than £20,000 and substantial reserves had been built up. The last balance-sheet showed investments totalling £46,500 and cash £32,000. The company had considered using the assets to buy another business, but nothing suitable had been found.

ACCIDENT AGED MINER

SUBMISSION that a 64-year-old colliery worker was "obviously made much older in many respects" by an accident underground at North Celynen Colliery, Newbridge (Mon), was made by Mr. E. Ryder Richardson, QC, appearing for Mr. Edward William Owens at Monmouthshire Assizes.

It was stated that Mr. Owens, who had been working underground for more than 50 years, was working at a coal face which was dangerous because of overhanging coal. As he was making a hole in the roof to put up a post, coal fell from the top of the face and caused injuries which incapacitated him for six months.

For the NCB Mr. A. King-Hamilton, QC, denied breach of statutory duty and alleged contributory negligence. Mr. Owens was awarded £750 damages.

STOLE TO NO PURPOSE

UNABLE to give any explanation for having defrauded the National Coal Board of sums amounting to £474 6s. 7d., William Watson Malcolm (46) was sentenced to nine months' imprisonment at Haddington Sheriff Court. Watson was employed as a despatch clerk at Glencairn Colliery, Longniddry (East Lothian), when the offences took place.

For Malcolm it was stated that he earned £11 8s. a week. It was not the usual case of extravagant habits and there seemed to be no purpose in what he had done. The money, which had been placed in a drawer, had not been touched and had been repaid.

Sheriff K. W. B. Middleton said it was a case of deliberate fraud. The fact that Malcolm had repaid the money had meant a lighter sentence than would have otherwise been the case.

MINER AWARDED £2,375

AFTER agreement had been reached between counsel at Monmouthshire Assizes Mr. Justice Davies entered judgment for £2,375 and costs for Mr. Alfred Horace Burton (45), a miner at McLaren Colliery, Abertysswg.

It was stated that a conveyor belt caught in a tension box and stopped. The cover was taken off the box to clear out the dust and Mr. Burton fell into the exposed machinery when his heel caught in a chain. The conveyor started and his arm was injured.

For the NCB, Mr. Philip Graham, QC, alleged that Mr. Burton failed to keep a proper look-out.

PLAINTIFF 75 PER CENT. TO BLAME

PIT deputy, Mr. William Calvin, was awarded £1,500 damages by a jury sitting with Lord Wheatley in the Court of Session, for injuries sustained in an accident with a conveyor belt at Whitrigg Colliery (West Lothian). The plaintiff, who sued for £10,000, claimed that as a result of the accident his left hand and arm had been rendered virtually useless.

The National Coal Board denied liability and also maintained that the sum sued for was excessive. The jury assessed total damages at £6,000, but held that Mr. Gavin had been 75 per cent. to blame.

Coal Industry "Very Much Alive"

MR. T. S. CHARLTON SAYS: "KILL THESE RUMOURS"

ENGINEERS should help to "kill absolutely" loose talk about the coal industry being finished, said Mr. T. S. Charlton, deputy chairman of the West Midlands Divisional Coal Board, on Saturday. Mr. Charlton, who was addressing members of the North Staffordshire branch of the Association of Mining Electrical and Mechanical Engineers at their annual dinner in Stoke, urged: "With your help, the board will be a good deal more efficient in the future."

He said that the drop in coal consumption was very trivial and that the industry was very much alive. As far ahead as could be seen, he went on, the coal industry would be able to offer good prospects to newcomers.

MR. T. S. CHARLTON

Engineers, Mr. Charlton stressed, should act as salesmen for the industry. "No one knows better than you how to use coal to the best advantage," he said. Mr. Charlton complained that proposed pit closures in the West Midlands were long overdue. "For more than 20 years we have had to keep old and derelict pits alive to please the nation," he said. "Now we can take our time, do a bit of weeding out and reorganizing, and get the board on a sound economic basis."

The national president of the association, Mr. E. Loynes, said the economic efficiency of future industry would depend on mechanization and electrification, which meant a far greater demand for engineers and technicians. "I can only deplore the tendency in some mines and by some managements to keep down costs by cutting engineering staff to a minimum," he declared.

ENGINEERS GET SHORTER WEEK

FROM March 28 some 3,000,000 engineering employees will be working a 42-hour week without loss of pay. The Confederation of Shipbuilding and Engineering Unions decided on Thursday of last week to accept the employers' offer of a two-hour reduction in the working week. The employers estimate that this will increase labour costs by about 6 per cent. at a cost to the industry of some £100,000,000 a year. The unions' pay claim has been dropped—at least for the time being.

The unions will accept a similar offer from the Shipbuilding Employers' Federation, subject to a satisfactory arrangement for the pay of workers on piece rates.

Geological Society Awards

FOLLOWING awards for 1960 have been made by the council of the Geological Society of London:—

Wollaston Medal to Prof. C. E. Tilley, Professor of Mineralogy and Petrology, Cambridge, for his researches in mineralogy and petrology especially with relation to metamorphism.

Murchison Medal to Dr. A. G. MacGregor, formerly assistant director of the Geological Survey (Scotland), for his work in vulcanology and petrology and problems of the metamorphic rocks in Scotland.

Lyell Medal to Dr. Doris Reynolds for her work on the rocks of Northern Ireland and her contributions to petrogenesis.

Prestwich Medal to Sir Vivian Fuchs in recognition of the geological work of the expeditions which he has led.

Wollaston Fund to Mr. M. A. Calver, of the Geological Survey, for his work on faunas of the Coal Measures.

Murchison Fund to Dr. D. V. Ager, Lecturer in Palaeontology at Imperical College of Science, for his researches on brachiopods and on mesozoic stratigraphy.

A moiety of the Lyell Fund to Dr. J. D. Lawson, Lecturer in Geology, Birmingham University, for his work on the stratigraphy and palaeontology of the Ludlow rocks of the Welsh Borderland. Another moiety of the Lyell Fund to Dr. R. H. Cummings, Lecturer in Geology, Glasgow University, for his researches on the morphology and evolution of the carboniferous foraminifera.

SCOW to Install Continuous Casting Plant

THE continuous casting plant to be installed by the Steel Company of Wales, Limited, as part of its development programme, will be the largest of its type outside the USSR. A twin-strand unit, it will produce slabs from 27 in. by 6 in. to 48 in. by 9 in. and up to 21 ft. in length from basic-Bessemer steel.

The well-known BISRA process will be used and the plant will be supplied by Continuous Casting Company, Limited, Weybridge (Surrey), licensee for the BISRA continuous casting processes. The company is an associate of Campbell, Gifford & Morton, Limited, Davy & United Engineering Company, Limited, and Newton, Chambers & Company, Limited.

SETTLE, SPEAKMAN & COMPANY, LIMITED—Mr. A. H. Walker has been elected an additional director.

Obituary

MR. WILLIAM DEWHURST

MR. WILLIAM DEWHURST, who has died at the age of 59, had been with Newton, Chambers & Company, Limited, Thorncliffe, near Sheffield, since 1947 and was the company's engineering division's sales representative concerned with iron and steel works plant. After leaving Sheffield University he served in the Royal Field Artillery during the first world war. On demobilization in 1920 Mr. Dewhurst joined his family's firm, the Dewhurst Engineering Company, Limited, Sheffield, and worked as a draughtsman and later as a sales representative with that company until 1931, when Newton, Chambers & Company took over the goodwill of the iron and steel works plant business of the Dewhurst Engineering Company.

Mr. Dewhurst went to Germany in 1932 taking a post as an engineering inspector of railway stock. He was associated with the Turkish State Railways and from his headquarters in Essen travelled extensively through Germany and Czechoslovakia. He remained in that post until just before the outbreak of war in 1939. For a year or so he was London representative of the Leystol Engineering Company and then in 1941 he joined the Ministry of Labour and National Service as a labour supply technical officer. It was from that position that he joined Newton, Chambers in October, 1947. At first he was the section leader dealing with iron and steel works plant, but when his health began to deteriorate he preferred to go out on the road. In the past few years he had to spend many months in hospital, but always came back to his work with cheerful optimism and real courage.

MR. C. A. TAYLOR

THE death took place suddenly on Thursday of last week of Mr. Charles Anderson Taylor, who, until his retirement last October, had been Group manager of No. 4 Group, Central East Area, of the Scottish Divisional Coal Board since 1952. He was 63.

After service with the Merchant Navy in the first world war, Mr. Taylor started his career in the coal-mining industry as an engineer. He was appointed undermanager at Mount Vernon Colliery in 1930 and subsequently held official positions in the Fife, Northumberland, and Lanarkshire coalfields.

Mr. Taylor was a former member of the council of the Scottish branch of the National Association of Colliery Managers and had taken a keen interest in miners' social welfare activities.

Major GEORGE FROST BAREN, one of Southern Rhodesia's earliest mining men, who was responsible for opening up some of the country's first mines in Gatooma, Hartley, Mount Darwin, and Bindura, has died. He was 85.

The death has occurred of Mr. EDWIN RANSOM HARRISON, chairman from 1931 until 1954 of the Rover Company, Limited, Solihull. He was 75. Mr. Harrison was an accountant by profession and after setting up his own accountancy business in Sheffield he was associated with steel firms and became a director of Kayser, Ellison & Company, Limited, and Walter Spencer & Company, Limited, both of Sheffield.

The death occurred on Tuesday of last week of Mr. THOMAS HENRY SELLARS, one of the founders of Sellars & Parkes, Limited, upholstery spring manufacturers, of Hyson Green, Nottingham. He was 77. He retired from business three years ago.

The death is reported of Mr. WILLIAM LIVEY, who was associated with the coal trade all his working life. He left United Collieries, Limited, Glasgow, to join William F. Russell & Sons, Limited, coal distributors, etc., also of Glasgow, and became a partner in that firm. In 1933 Mr. Livey established his own business, trading under the title of Wm. Livey & Company.

Mr. SAMUEL BARON TURNER, who died on Monday, was managing director of Pickford, Holland & Company, Limited, makers of refractory products, of Sheffield. He was 47. He was appointed to the board in 1948 and became managing director in 1956. A Fellow of the Institute of Ceramists, Mr. Turner was a former chairman of the Magnesite and Chrome Brickmakers' Association, a vice-president and member of the council of the Refractories Association of Great Britain, and a member of a number of committees of the British Ceramic Research Association.

The death has occurred of Mr. GEORGE ROWLAND SILKSTONE, chief accountant of Area No. 4 of the East Midlands Divisional Coal Board until his retirement in 1950. He was 79. Mr. Silkstone, who spent all his working life in the mining industry, joined the Blackwell Colliery Company, Limited, Alfreton (Derbyshire), in 1897 as a junior clerk and rose to become the cashier and assistant secretary, and then, in 1938, secretary. On the amalgamation of the company with the New Hucknall Colliery Company, Limited, in 1945, Mr. Silkstone was appointed commercial manager. He became Area chief accountant on nationalization.

Mr. THOMAS WEBSTER, of Ashton-in-Makerfield, who died on Saturday, aged 87, was formerly manager of Long Lane Colliery, Ashton. He was employed for 45 years by the former Garswood Coal & Iron Company and was for 15 years also at Arch Colliery. He obtained his first-class mine manager's certificate in 1907 and from 1915 for many years he was a part-time lecturer in mining subjects at evening and Saturday afternoon classes at Wigan Mining and Technical College. In other spheres, Mr. Webster was chairman on three occasions of Ashton-in-Makerfield Urban District Council, chairman for 21 years of the Ince Divisional Labour Party, and a former president of Ashton Labour Party.

Increased Bids for Redler Industries

INCREASED bids for the ordinary capital of Redler Industries, Limited, have been forthcoming. Ley's Foundries & Engineering Company, Limited, which made the original offer, has raised its offer from 12s. to 13s. 6d. in cash for each Redler share, while Cozens & Sutcliffe (Holdings), Limited, again overbid Ley's Foundries by offering one Cozens share for every Redler share.

Both bidders stated that their latest bids would apply to all Redler shareholders who had accepted their original offers. On Wednesday it was announced that the Ley's Foundries' offer had been extended until February 22.

High Temperature Cowper Stoves

While the blast furnace, during its long history, has undergone many modifications, its essential operating principles have remained unchanged. This is also true of certain auxiliary plant such as blowers and Cowper hot-blast stoves for supplying to the tuyeres pre-heated air for raising the efficiency of combustion. This article discusses the bearing of increased blast-furnace capacity on the development of Cowper stoves. It has been summarized from the French contribution by M. D. Petit to last year's steel recuperator conference, held in Paris, and arranged by the four companies: Metallurgical Engineers, Limited, London; SETREM, Paris; Rekuperator KG, Dr.-Ing. Schack & Company, Düsseldorf; and Griscom-Russell-Schack Company, Incorporated, Pittsburgh.

BLAST temperatures, it may be pointed out, which 10 or 20 years ago were 600 to 700 deg. C., have risen steadily and, for the majority of French blast furnaces, are now, in practice, 850 deg. C., although based on a projected temperature of 900 to 930 deg. C. at the bustlepipe.

New Cowper stoves are constructed to last 20 or 30 years, and it must be anticipated that during this period metallurgists will wish to use higher and higher temperatures, so that in a new or reconstructed installation, it is necessary for provision to be made for attaining these higher temperatures.

Addition of Steam to the Blast.—This procedure is very popular now and all recent requests for Cowper stoves incorporate the possibility of adding 0.0015 to 0.003 lb. of water vapour per cub. ft. of blast.

This procedure permits or even makes necessary an increase of blast temperature of approximately 200 deg. C.

Development of Sintering.—The use of sinter leads to a lowering of the calorific value of the gas and, on modern installations, it is foreseen that they will produce a gas with as low a calorific value as 90 to 95 BTh.U/cub. ft. In the United Kingdom, where sintering is more developed, even lower values are attained or are expected to be attained.

Increase of Production.—Simultaneously, the hearth diameter of blast furnaces is constantly increasing and, even in France, coke consumption of over 1,000 *tonnes* per 24 hr. can be foreseen.

Present Situation of Cowper Stoves

It must be recognized that Cowper stoves have undergone little development during the last 20 or 30 years, and their construction is such that it is difficult to improve their performance. They no longer correspond to the needs of modern blast furnaces, notably with regard to blast temperature and the possibility of using lower calorific gas.

Lastly, the capacity of stoves constructed within existing casings, especially, is often insufficient to supply the needs of the blast furnace which is constantly increasing its output.

It is proposed to study here methods of improving stoves in order that they may correspond to present and future requirements of the blast furnace.

To fulfil these requirements, it is necessary: (*a*) To obtain a high blast temperature with gases of lower calorific value; (*b*) that the quality of the refractories should be appropriate to the higher temperatures; (*c*) that the checker-work should be designed and calculated for the new requirements; and, finally, (*d*) that within casings of reasonable dimensions, one should be able, with a satisfactory construction, to supply blast furnaces whose dimensions will be constantly increasing.

High-temperature Cowper Stoves

By increasing the dome temperature of the Cowper stove, the foregoing problems can be solved, in particular that of increasing blast temperature with a gas whose calorific value has a falling tendency.

The solution of this problem consists of pre-heating the combustion air for the stove burners to a temperature which varies normally between 400 and 600 deg. C. This increase is sufficient in practice to obtain, with a gas of 90 to 95 BTh.U/cub. ft., the high temperatures which correspond to present needs and, probably, to the future needs of iron-making.

Fig. 1 shows the temperature of the dome and of the blast in normal Cowper stoves, fired with a gas of calorific value varying between 90 and 118 BTh.U/cub. ft. The figures given are not absolutely exact, but correspond to an average of what is obtained in practice.

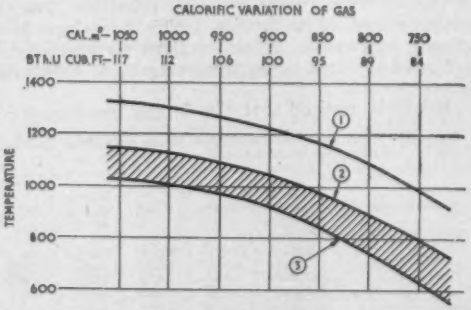

FIG. 1.—TEMPERATURES IN ORDINARY COWPER STOVES.
(1) Maximum dome temperature. (2) Maximum air temperature. (3) Minimum air temperature.

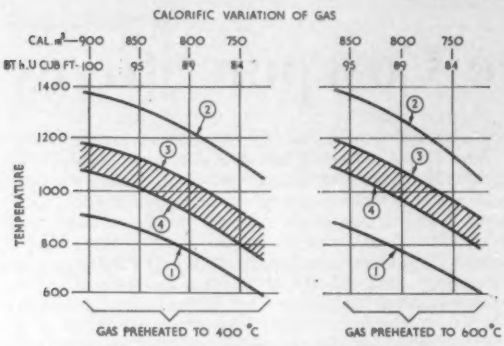

FIG. 2.—TEMPERATURES IN COWPER STOVES.

(1) Minimum air temperature without pre-heating. (2) Dome temperature with pre-heating. (3) Maximum air temperature with pre-heating. (4) Minimum air temperature with pre-heating.

Fig. 2 shows temperatures obtained in a Cowper stove for which the combustion air is pre-heated to 400 deg. C. only. If the air was pre-heated to 600 deg. C., a further increase of 50 deg. C. would be gained. Fig. 2 also shows that with a gas whose calorific value drops to 90 BTh.U/sub. ft., a blast temperature of 1,050 deg. C. after reversal, dropping to about 850 deg. C. can be obtained. These figures are practical figures obtainable in normal operation.

These temperatures should be sufficient for the majority of blast furnaces; if in doubt, one could, as already stated, improve these figures by 50 deg. C. by pre-heating the combustion air to 600 deg. C., instead of 400 deg. C.

Refractories

All that has just been said of the relatively low blast temperatures refer to Thomas blast furnaces. It is well-known that furnaces producing foundry pig-iron, and especially ferro-manganese, work at higher temperatures, and it is possible to cite cases of Cowper stoves made to specifications which have worked for 30 years with a dome temperature of 1,330 deg. C.

They were, however, made, as was the practice in those days, with material relatively low in alumina and of a quality which has since been greatly surpassed. Some modern Cowper stoves are working with dome temperatures of 1,400 deg. C.

It will be noticed that Fig. 2 only provides for a dome temperature of from 1,310 to 1,350 deg. C., but within a few years, these figures will almost certainly be exceeded, even on Cowper stoves for Thomas blast furnaces.

It is known that many operators fear collapse of the refractories under these conditions. To reassure them Table 1 is included, being the results based on a series of tests presented by the author to the British Ceramic Society in 1939.

During the last 20 years, progress has been made in the production of refractories and, without doubt, materials can now be manufactured which would resist temperatures of 1,400 deg. C. in the upper part of the Cowper stove.

What has been said is valid only for clean (dust-free) gases. If difficulties occur in the passages of the stove, they will originate from the use of dust-laden gas or combustion air. It is by chemical action that the bricks of a Cowper stove are attacked; it is, fortunately, easy to remedy this by using gases of sufficient cleanliness.

TABLE 1.—*Tests giving the Deformation Points of Different Quality Refractories under a Pressure of 28.5 lb./sq. in.*

Alumina content.	Silica sand.	30/36.	40/42.	Surco-prime 40/42.	Silica.
	deg. C.	deg. C.	deg. C.	deg. C.	deg. C.
Start of deform. ..	1,320	1,350	1,370	1,435	1,650
0.5 per cent. ..	1,360	1,400	1,370	1,475	1,670
1 ,, ..	1,390	1,440	1,425	1,510	—
2 ,, ..	1,420	1,470	1,465	1,530	—
5 ,, ..	1,440	1,490	1,525	1,555	—
10 ,, ..	1,480	1,535	1,555	1,585	—

Design of the Checkers

Checker design must naturally be carefully studied in order to suit working conditions at high temperatures. This definitely condemns Cowper stoves having in the upper section large passages with thick walls.

The rational formula is: In the upper section, passages of sufficient size to avoid all risk of obstruction. These passages should always have a minimum dimension of 2 in.

Lower down in the stove is retained what is known as " variable turbulence," which leads to the best possible utilization of the surfaces, by means of a suitable arrangement of the bricks. Towards the base in the zone where the heat transference is more difficult, there is an increase of turbulence.

The results obtained with those stoves that have already been constructed on this principle, and which have been made the subject of controls and tests, notably by the IRSID, are the best proof that this principle is sound. It leads also to minimizing the danger of obstructions due to the fall, over the years, of pieces of brick into the checkerwork, either during working or during the course of repairs.

Storage Capacity

An important advantage of high-temperature operation is the considerable increase in the heat storage capacity of the Cowper stove. This statement is self-evident and needs no demonstration. Control tests, carried out at Denain, Louvroil and Senelle Maubeuge, have shown that the figures obtained in practice are clearly superior to those obtained from published graphs.

In some works, where the stoves are too small, it can be shown that increasing the dome temperatures, sensibly increases their capacity to serve larger blast furnaces. Thus a works possessing relatively small stoves which were in excellent condition, reconstructed the checkerwork completely so as to give a greater weight of refractory. It had been demonstrated to the firm that, by increasing

the temperature by 150 deg. C., one would easily be able, with the same stoves, to serve, not only larger blast furnaces, but would even give an additional margin of 20 per cent. for a further increase in production.

The question of capacity and of heat storage leads to an observation which is of importance.

Operating stoves at high temperatures does not imply that the temperature in the bustle-pipe would be raised by an equal amount. In the US, stoves operate at a higher temperature than is generally known, but the temperature in the bustle-pipe is considerably lowered by the addition of cold air. Nothing prevents American practice being adopted in Europe; this would allow advantage to be taken of the benefits of high temperature, while allowing blast-furnace operators to vary within wide limits, the temperature in the bustle-pipe.

Economics of High-temperature Operation

Coke and Gas.—Colclough, in a paper presented in 1958 to the Iron and Steel Institute, established that, with a prepared charge, an increase of blast temperature from 800 deg. to 1,000 deg. C. corresponds to a coke saving of 5.86 per cent. Certain French metallurgists give higher figures; others are more cautious and forecast lower figures. In this connection, however, it is necessary to make allowance for the extra gas consumed to heat the air to a higher temperature, and it would appear that, by supplying indirect heat to the stove by means of pre-heated combustion air, it would lead to a lower thermal efficiency.

In fact, the quantity of gas consumed in pre-heating the combustion air temperature by 400 deg. C. is of the order of 20 per cent. of the total gas consumption. The thermal efficiency of the pre-heater is roughly 75 per cent. while that of the Cowper stove is from 85 to 90 per cent.

One would, therefore, think that pre-heating the combustion air would lead to a lower efficiency of from 2 to 3 per cent. In fact this loss in efficiency is compensated, more or less, by an increase in the return from the stove, which, for an equal heat input, is higher, if the dome temperature is higher.

In practice, the additional consumption of gas simply corresponds to the increase in temperature of the blast, figures easy to establish in each particular case.

Furnace Production.—It is generally recognized that the capacity of a furnace is limited by the coke consumed. If, then, one obtains an economy of coke per ton of iron produced, one should be able, logically, to increase production.

Advantages of the Use of Steam in the Blast.—Here, again, this matter is still open to question, but if one believes that the majority of furnace operators are inclining to the use of steam, it is prudent to make provision for this, although it necessitates higher blast temperatures.

Storage Capacity.—Summarizing what has been stated about increasing storage capacity in certain cases, to enable Cowper stoves to supply faster working blast furnaces, and in certain other cases, using higher temperatures to permit the development of heat storage, it appears that for new or renovated Cowper stoves, which must last for 20 to 30 years, one must, from now on, foresee the possibility of an increase in use of high temperatures. New stoves should either provide for this immediately, or their size should make it possible to achieve it later.

Cowper Stove Installation for Large-capacity Blast Furnaces

Fig. 3 represents a Cowper stove, approximately 28 ft. dia. and 126 ft. high, designed for a blast furnace with a coke consumption of 1,200 to 1,600

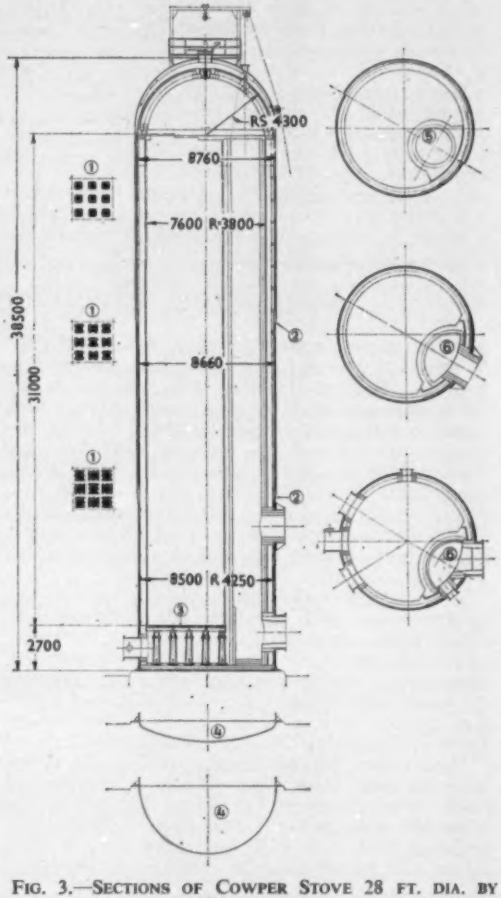

FIG. 3.—SECTIONS OF COWPER STOVE 28 FT. DIA. BY 126 FT. HIGH.

(1) Checker work arrangements for variable air turbulence. (2) Outer casing. (3) Chrome-iron grill. (4) Curved bottom plates. (5) Cylindrical shaft. (6) Oval shaft.

tonnes/24 hr. The features of this Cowper stove are as follow: weight of checkerwork, 1,300 *tonnes*; surface area of checkers, 470.000 sq. ft.

These modern stoves can be built with oval or with round casings, which, in both cases, must naturally be self-supporting. The grill is independent of the casing and the lining.

The casing is conical, the diameter at the upper part being greater than that at the bottom. This shape is the only rational means of obtaining a satisfactory brickwork arrangement.

Fig. 4 shows the arrangement of a battery of three Cowper stoves of this type, equipped with an air pre-heater of 3,500,000 cub. ft. capacity.

The advantages of this arrangement are that a blast temperature of 900 to 1,000 deg. C. or even 1,100 deg. C. is obtained with a gas of 90 BTh.U/cub. ft.; it permits the use of steam in the blast; it provides very flexible operating conditions within a casing of reasonable dimensions; it permits the adoption of hourly reversals with a blast of 1,000 deg. C., and an appreciable heat storage capacity, even with high temperatures.

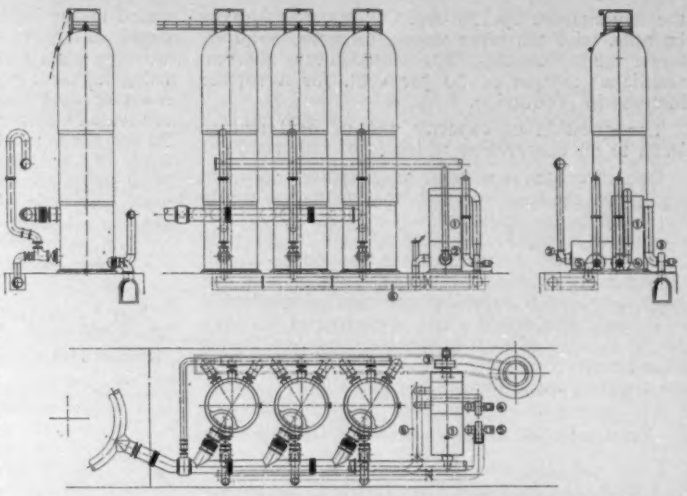

FIG. 4.—BATTERY OF THREE COWPER STOVES WITH AIR-PRE-HEATING.
(1) Pre-heater. (2) Burner. (3) Fan for pre-heater. (4) Main ventilating fan. (5) Standby fan. (6) Hot air main to burners.

Associated Electrical Industries (Rugby)

IN its progress report for 1959, Associated Electrical Industries (Rugby), Limited, formerly the British Thomson-Houston Company, Limited, states that on behalf of an Australian steel mill, Australian Electrical Industries (Pty), Limited, has ordered d.c. motors to drive a new five-stand tandem cold-strip mill. One stand will be driven by a 2,000-h.p. motor, three others will be twin drives, consisting of two 2,000-h.p. motors, and the fifth will consist of three coupled motors with a total output of 5,500 h.p. Three motors, totalling 1,250 h.p., will drive the tension reel.

The mill motors will be supplied by two motor-generator sets, each of which will be driven by a synchronous motor rated at 10,000 h.p. Electronic and other control equipment will also be supplied. The same customer has also ordered a 1,000-h.p. d.c. motor for driving a merchant mill, and a 500-h.p. motor, with a grid-controlled mercury-arc rectifier, for driving the edger of a billet mill.

New orders for rectifier-fed rolling-mill drives were received from Steel, Peech & Tozer, and from John Summers & Sons, Limited. The latter has ordered for a new 56-in. 3,000-ft./min. reversing cold strip mill, four 2,000-h.p., 171/478 r.p.m. d.c. motors and 22 mercury-arc rectifiers, with a total capacity of 8,530 kW at 750 volts.

Manufacture of a 6,000-h.p., 40/80-r.p.m. twin-motor reversing drive for a 12-ft. plate roughing mill at the Appleby-Frodingham Steel Company's Scunthorpe works is almost complete. This mill, when commissioned in the summer, will operate in conjunction with the 8,000-h.p. plate finishing mill installed in 1958. The motor-generator set, a duplicate of that of the finishing mill, comprises four 1,600-kW generators, a 6,000-h.p. induction motor and a 32-ton cast-steel flywheel.

A rectifier/inverter reversing mill equipment, believed to be the largest in the country, has been installed in a billet and rounds mill at the Stocksbridge works of Samuel Fox & Company, Limited.

Mining Equipment

A reduction in capital investment in the mining industry has resulted in the placing of fewer orders than in previous years. During 1959 a number of orders for winders using mercury-arc converters were received, including a 1,400-h.p. winder having a manual closed-loop control system. It is scheduled for operation in the No. 5 shaft of the National Coal Board's Hucknall No. 2 Colliery. After 18 months' operation the winder will be automatically controlled. During the year four winders with mercury-arc rectifiers were commissioned.

Winder Brake Lining

The longest brake lining currently in manufacture by Ferodo, Limited, Chapel-en-le-Frith (Derbys), has a length of 16 ft. 7 in., a width of 16 in. and a thickness of 1 in. This outsize woven lining was recently produced for a colliery winder brake.

POWER LOADING IN THE EAST MIDLANDS

Part 1—Recent Developments in Large-coal Production

By J. SHELDON, B.Sc.Eng.(Min.), M.I.Min.E.*

Development trends in all phases of face mechanization in the East Midlands Division of the National Coal Board are reviewed in this paper, presented to the Midland Branch of the National Association of Colliery Managers on October 19, 1959. The mechanization of stable holes and rippings, a need which has long been recognized, is discussed in the second part of this paper, which will appear in next week's IRON AND COAL.

SOME time has elapsed since an appraisal of the effects of power loading in the East Midlands Division of the NCB was made at the Symposium on Power Loading arranged by the Midland Counties Institute of Engineers in April, 1958. The timing of the symposium was opportune, in that the difficulties in which the industry now finds itself had become apparent. Stocks of small coal have since begun to build up, and sales have begun to fall away owing to a general recession in industry and to competition from other fields.

During 1959, a number of uneconomic pits were closed in some divisions and some restriction of open-cast mining has occurred in an endeavour to close the gap between production and demand. These measures have not succeeded completely in closing this gap and stocks of small coal have continued to rise. A mild winter in 1958/59 and an exceptionally good summer have not helped the situation.

Thus, faced with these facts, the coal industry as a whole has to become competitive in the supply of fuel to all industry and also to become more efficient in production techniques; indeed, we have entered an era, for the first time under nationalization, of chasing the last ounce of efficiency. As far as the East Midlands Division is concerned, the seams are generally of only medium quality. Many have one or more dirt bands and many have intergrown coal and roof dirt. It is sometimes necessary to cut partially in floor dirt below the seam. The quality of the saleable product is of prime importance and, for industrial purposes, the maintenance of consistency of product is vital.

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Again, in dealing with coals of low selling price, low production costs are a necessity if the pit is to be economic. Against this background, it seems sensible to continue to increase mechanization as rapidly as possible, mainly on grounds of increased production efficiency.

In considering the trends in development of coal-face mechanization in the East Midlands, it would firstly be advisable to consider what has been achieved to date.

The Present Position

Table 1 indicates the progress made in mechanization in the division in the last 5½ years. It is apparent that in spite of the difficulties of the first six months of 1959, power loading is now firmly established as the "conventional system" of mining.

The overall saleable o.m.s. from power-loaded faces has continued to rise, and, together with a recent upward trend in o.m.s. from hand-filled faces, has resulted in a face o.m.s. from the division of approximately 5.5 tons (saleable). This increase in face efficiency has also been reflected in the overall o.m.s. for the division of over 2 tons per manshift all employed. One factor, however, mars this performance—*i.e.*, the stock of small coal on the ground.

The problems confronting the further expansion of mechanization in the division may, therefore, be stated as: (1) To reduce the make of small coal and increase the +2-in. sizes made, with special regard to a reduction in the proportion of −¼-in. coal; (2) to continue to strive towards greater concentration and production efficiency at the face as well as outbye; and (3) to relate (1) and (2) above to

TABLE 1.—*Progress of Mechanization in the East Midlands Division.*

Period.	Total output (saleable).	Mechanized output (saleable).	Per cent. of mechanized output	No. of installations.	Conventional o.m.s.	Mechanized o.m.s.	Overall o.m.s.
	Tons.	Tons.			Tons.	Tons.	Tons.
1954..	45,282,697	7,251,906	16.02	77	4.44	6.27	4.65
1955..	45,752,680	8,288,419	18.12	121	4.45	6.11	4.70
1956..	45,980,498	11,116,392	24.18	189	4.42	6.22	4.74
1957..	46,736,916	17,731,428	37.94	250	4.35	6.46	4.96
1958..	45,451,086	22,202,511	48.85	282	4.18	6.61	5.25
First half 1959 ..	23,318,378	12,419,568	53.26	302	4.53	6.87	5.54

the problem of mining thinner seams more efficiently and maintaining, as far as is possible, that degree of concentration attained in the thicker seams.

REDUCTION OF SMALL COAL

The approach to the problem of small coal has been twofold. Firstly, having in mind the high quality of certain seams, it has been agreed that in these seams Anderton shearers would be replaced by trepanners and Anbauhobels. Secondly, since early 1958 investigations have been carried out into the production by the Anderton shearer drum of a larger and rougher product. This approach is because of the ease and simplicity of operation of the Anderton shearer, and its high performance.

Obviously, if this machine could be adapted to yield a product consistent with present needs, then less disorganization at pits would occur as a result of changing techniques and machines. Also, the machine was, and still is, universally popular.

There are three distinct lines of approach to the problem of producing a larger and rougher product from Anderton shearer loaders, namely: (1) To increase pick penetration; (2) to make the drum capable of more rapid clearance of the cut coal; and (3) to reduce the area of contact of the drum.

Pick Penetration

Factors influencing pick penetration are: Horsepower available at the pick point; machine haulage speed; pick speed; pick lacing; and de-stressing of the coal *in situ* prior to machine operation.

Horsepower Available.—All mining machinery manufacturers have recognized the need for higher horsepowered machines and have reacted quite quickly in the production of suitable models. Presently available machines are listed in Table 2.

TABLE 2.—*Motor Ratings of Available Power Loading Machines.*

	New motor.		Old motor.	
	H.p.	Rating.	H.p.	Rating.
Anderson Boyes	80	2 hr.	70	1 hr.
British Jeffrey-Diamond ..	80	Continuous	75	,,
	125	,,		
M & C	90	1 hr.	60	,,
Eickhoff	100	Continuous	82	Continuous
NCB Design	100	,,	—	—

It is to be expected that the wider application of these newer motors will help towards greater pick penetration and improvement in product sizing.

Haulage Speed.—Tests have been carried out in one Area in the division to determine what relationship, if any, existed between product size and haulage speed. While only barely marginal improvement was obtained in the +2-in. size, there was, at 6 ft./min. haulage speed, marked increase in the $+\frac{1}{4}$-in. sizes compared with 2 ft./min. haulage speed. Also the $-\frac{1}{16}$-in. size decreased by 5.57 points at the higher haulage speed. Such a single test cannot be completely conclusive, but sufficient evidence was obtained to warrant further extensive tests of this nature which are being undertaken on the headquarters experimental face at Donisthorpe Colliery in Area 7, East Midlands Division.

Pick Speed.—No factual information is available on the relationship between pick speed and product sizing up to the present time. It is, however, to be expected, provided that all other factors are equal, that a lower pick speed will give an increase in product size. Obviously, there will be a lower limit beyond which further reduction in speed would add to the amount of recirculation with a consequent increase in degradation. Again, in view of the importance of establishing the degree of relationship between pick speed and product size, the facilities available on the headquarters experimental face are being used to this end.

Pick Lacing.—Many experimental drum lacings have been tried in different Areas and divisions. It has been found that patient investigation can produce lacings which will again show limited improvements in product sizes, particularly in the lower ranges. No hard and fast rules can be applied, since such lacings will vary according to local conditions. Generally, the fewer picks that can be used consistent with the machine power available, the greater the relative improvement.

De-stressing of the Coal.—A number of sizing tests have been taken on faces where pre-cutting has been tried. The general experience seems to be that when using conventional drums, the influence of the smalls produced by the pre-cut chain more than offset the benefits gained by pre-cutting. The product under these circumstances shows little or no improvement and sometimes even worsening. Thus, with standard types of drum, it appears that pre-cutting should only be resorted to in those cases where the hardness of the coal is such as to impose excessive loading on one machine.

However, in cases where a paddle-type drum is used, some marked improvements have been effected. In one case, a Robinson-type drum gave the results shown in Table 3, before and after pre-cutting. In the latter case, pre-cut gummings are included.

TABLE 3.—*Sizing Tests after Using a Robinson-type Shearer Drum, with and without Pre-cutting.*

Size.	Percentage in different fractions (r.o.m.)		
	Before Pre-cutting.	After Pre-cutting.	Difference.
+ 6-in.	0.81	1.64	+0.83
6-in.–4-in.	1.13	1.95	+0.82
4-in.–2-in.	3.13	4.74	+1.61
2-in.–1-in.	9.62	9.81	+0.19
1-in.–$\frac{1}{4}$-in.	21.94	21.38	−0.56
$\frac{1}{4}$-in.–$\frac{1}{8}$-in.	32.56	30.27	−2.29
$\frac{1}{8}$-in.–30 mesh	20.54	20.75	+0.21
30-m.–60-m.	4.80	2.93	−1.87
60-m.–0	5.92	6.53	+0.61

In this test, the drum size was 51 in. by 20 in. and the seam height extracted was 51 in.

Improved Clearance by the Anderton Shearer Drum

With the conventional type of drum, the area presented to the cut coal to carry it round the profile of the cut and to discharge it on to the plough, is only the cross-sectional area of the picks and pick boxes. On a 20-in. drum, this carrying area is

approximately 25 sq. in. compared with the total area of approximately 115 sq. in., or only 22 per cent. of the total area.

In the first place, this was improved by building out the pick boxes on pads and welding paddle plates between the pads and pick boxes. A typical drum of this type yielded a carrying area between the drum shell and the buttock of 121 sq. in. and a non-carrying area of 54 sq. in. Thus, the carrying area was increased to 69 per cent. of the total area.

Further improvements in the paddle-type drum construction led to the carrying area being increased to 75 per cent. of the total sectional area in the case of the Heeley and Robinson type drums. These developments are listed in Table 4.

TABLE 4.—*Increased Carrying Area of Newly Designed Drums.*

	Carrying area (sq. in.).	Per cent. of total sectional area.	Non-carrying area (sq. in.).	Per cent. of total sectional area.
Conventional drum ..	25	22	90	78
Paddle drum, 5½-in. paddles	121	69	54	31
Pocketed drum ..	184	67	91	33
Heeley drum	164	75	56	25

From Table 4, it is noted that the Heeley drum offers the most effective carrying capacity, largely on account of the manner in which the picks are mounted, *i.e.*, not radially but almost tangentially as indicated in Fig. 1. At this stage, it must be clearly understood that the pocketed and Heeley type drums were developed outside the East Midlands Division, but that they have now been put to use in many Anderton shearer installations within the division.

Regarding the size produced by the pocketed drum, some tests taken in West Midlands Division are detailed in Table 5. The drum size was 54 in. by 20 in. and the pre-cut was 30 in. above floor level.

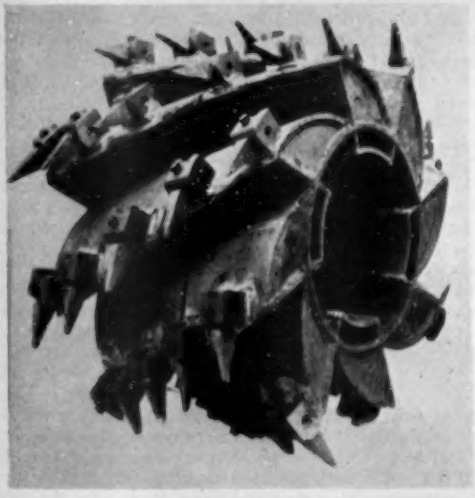


FIG. 1.—HEELEY SHEARER DRUM WITH ALMOST TANGENTIAL PICK MOUNTING.

TABLE 5.—*Test in the West Midlands Division with the Pocketed-type Shearer Drum.*

Fraction.	Conventional drum (pre-cut coal), wt. per cent.	Pocketed drum (pre-cut coal), wt. per cent.	Points improvement.
Plus 2½-in. ..	5.90	11.91	+ 6.01
2½-in. to 1¼-in.	10.33	13.93	+ 3.60
1¼-in. to ¾-in.	13.45	14.79	+ 1.34
Below ¾-in. ..	70.32	59.37	−10.95

These show quite a remarkable improvement in the amount of large and graded coals produced, while a substantial reduction of small and fines is obtained. Further tests in North-Eastern and East Midlands divisions comparing the Heeley-type drum with the conventional drum have been made. In each case, the drums were extracting the full working section and were of the size 44 in. by 27 in. The results are shown in Table 6.

TABLE 6.—*Results of Tests with the Heeley Drum in the North-Eastern and East Midlands Divisions, NCB.*

Fraction.	Conventional drum. wt. per cent.		Heeley drum, wt. per cent.		Points Improvement.	
	N.E. Div.	E.M. Div.	N.E. Div.	E.M. Div.	N.E. Div.	E.M. Div.
Plus 2-in.	2.96	9.9	3.87	20.6	+0.91	+10.7
2-in. to 1-in.	7.24	12.4	11.53	21.6	+4.29	+ 9.2
1-in. to ½-in.	20.05	22.8	22.14	22.4	+2.09	− 0.4
½-in. to ¼-in.	37.94	30.7	36.72	20.4	−1.22	−10.3
¼-in. to 30m.	23.06	18.6	18.54	11.2	−4.52	− 7.4
Below 30m.	8.75	5.6	7.20	3.8	−1.55	− 1.8

From Table 6 it can be seen that the Heeley drum in these circumstances has resulted in a substantial reduction in −½-in. coal, much of which is in the −¼-in. fraction.

As a result of the investigations into the characteristics of paddle and pocketed type drums, it is apparent that in the +2-in. fractions these types of drum can effect only marginal improvement. However, having in mind that even allowing for greater selectivity in choice of machine for new installations in the future, a number of shearers will remain in operation, then in relation to the ¼-in. to 0 fraction of the product, pocketed and paddle type drums can help in effecting a worthwhile reduction in this size of coal. In considering this point, it is worth noting that in July 1959, the number of Anderton shearers at work in the division equipped with paddle or pocketed type drums was 23.

It was apparent in the division early in 1958 that the conventional drum modifications could only at their best give marginal improvement in product sizing in relation to the magnitude of the small coal problem. With this factor in mind, a number of fresh approaches were encouraged with the object of trying to preserve the high bulk output and o.m.s. of the Anderton shearer installations, while at the same time maintaining their simplicity and achieving a better product. The develop-

ments under this heading have taken the following forms:—(i) Utilization of drums of smaller diameter than the seam thickness where coal parts freely from the roof; (ii) development of the lump shearer; (iii) development of the Muschamp "Coal Winner"; (iv) development of the "Mawco" frame shearer attachment; (v) development of the BJ-D large-coal shearer; and (vi) the independent development by Anderson Boyes and British Jeffrey-Diamond of the trepan shearer.

Utilization of Smaller Diameter Drums

Where seam conditions are favourable from the point of view of free-falling tops, then the smaller diameter drum of around 30 in. dia. with top coals falling with little or no assistance behind the machine has some advantage to offer. The thicker the seam, the greater the advantage from the large-coal point of view. However, in the East Midlands Division there are not many installations where this technique can be applied, either due to intergrown roof and coal, the need to leave roof coal to achieve good support at the face, or the lack of seams of suitable thickness to make the practice worthwhile from the marketing angle.

The results of a survey taken in mid-July, 1959, showed that there were 18 machines operating in conditions where the small drum could be used and top coals fell and could be ploughed on to the conveyor during the flitting run. In one particular case in a 5-ft. 6-in. seam, the product sizing was rather better than could be achieved by using a Meco-Moore cutter loader on the same face.

There is, therefore, no doubt that where shearers continue in use from the product size and marketing angle, the system should be adopted where seam thickness and general physical conditions will allow.

The Lump Shearer

The lump shearer was developed in Area 5 of the East Midlands Division. The conventional drum was replaced by a vertical disc mounted at the outboard end of the extended and sleeved right-angled drum shaft. Picks are mounted on the disc to give a 6-in. wide vertical shear, while the sleeved shaft carries mushroom-type picks.

Pre-cutting of the seam takes place at floor level using a coal-cutter mounted on the armoured flexible conveyor and working a few yards in advance

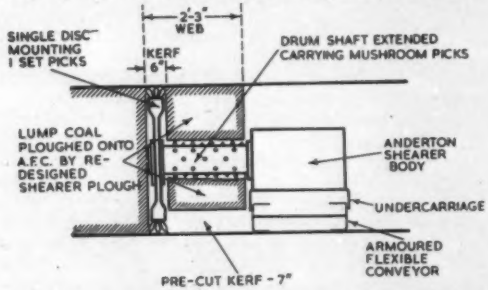

2'-3" WEB
SINGLE DISC MOUNTING 1 SET PICKS
KERF 6"
DRUM SHAFT EXTENDED CARRYING MUSHROOM PICKS
LUMP COAL PLOUGHED ONTO A.F.C. BY RE-DESIGNED SHEARER PLOUGH
ANDERTON SHEARER BODY
UNDERCARRIAGE
ARMOURED FLEXIBLE CONVEYOR
PRE-CUT KERF - 7"

FIG. 2.—GENERAL FEATURES OF THE LUMP SHEARER.

of the shearer on the shearing run. Behind the shearer, the coal flows on to a specially designed plough having a quick lifting and turnover action. Scavenging of the face takes place normally on the return flitting run. A seam having free-falling tops is an essential requirement for the operation of this machine, the general features of which can be seen in Fig. 2.

There are now four of these machines at work in Area 5 of the division, and a size analysis of one machine working in a seam thickness of 4 ft. 8 in. is shown in Table 7, compared with a conventional Anderton shearer working in a similar seam section.

TABLE 7.—*Size Analysis of Lump Shearer Compared with Anderton Shearer.*

Fraction.	Wt. per cent. r.o.m.		
	Lump shearer.	Normal Anderton shearer drum.	Improvement.
Plus 2-in. ..	33.5	8.20	+25.30
2-in. to 1-in. ..	12 6	12.43	+ 0.17
1-in. to ½-in. ..	18.8	20.28	− 1.48
½-in. to ¼-in. ..	18 5	34.61	−16.11
¼-in. to 30-m. ..	12.6	16.19	− 3.59
Below 30-m. ..	4.0	8.29	− 4.29

Pre-cut gummings are, of course, included in this analysis. In choosing this machine for a particular installation, regard should be had for the requirement of free falling tops and particularly for the fact that in using a 30-in. by 27-in. standard or paddle-type drum, the small coal produced would almost be equivalent to that from the lump shearer in a 69-in. seam. Below this thickness of 69 in., the advantage is with the lump shearer, while above this thickness the advantage is with the normal types of drum and dropping of the top coal.

Consideration must also be given to the organizational and practical difficulties where two machines and two ropes are in use in association with one armoured flexible conveyor on one face.

The Muschamp "Coal Winner"

The recent development by the Nottinghamshire firm of N. J. Muschamp & Company, Limited, of the "Coal Winner," is again designed to replace the conventional type of Anderton shearer drum. Fig. 3 indicates that the machine essentially consists of two 12-in. dia. drums, one shearing at roof level and one at floor level. The drums are coupled at the face side by a narrow kerf back shearing jib and the drive at the goaf side is from a 10-in. deep reduction gearbox driven from the right-angled shortened main output shaft of the standard BJ-D or Eickhoff gearbox.

The reduction gearbox is elliptical in shape and can be rotated around the main driving shaft. Thus with the prototype model, rotation of the gearbox, gives a possible seam working thickness variation of from 36 in. to 53 in., while the gearbox can be swung into a horizontal position for flitting in cases where it is essential to set bars to the newly-exposed roof immediately behind the machine.

Behind the head, and mounted on the leading

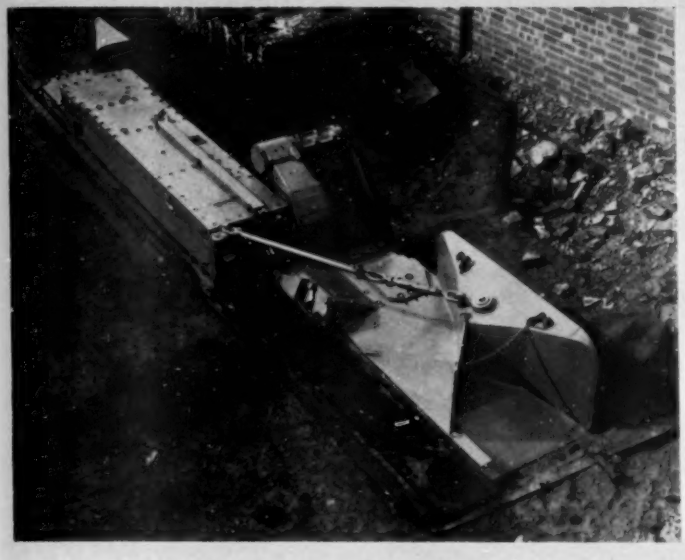


FIG. 3.—MUSCHAMP "COAL WINNER."

edge of the plough, is a flighted chain-type gummer loading unit driven from a hydraulic off-take from the main machine. The upright leading side of the plough is constructed in breaker wedge form to assist in breaking off the lump of coal passing through the framed section of the machine, and a deflector portion completes the leading side of the plough. For flitting, the deflector portion is swung backwards against a stop, thus ploughing of the residue is effected.

At a height of 3 ft. 6 in. with a depth of cut of 20 in., the percentage of solid coal left in the block is 28 per cent., while at 53 in. with a similar depth of cut the percentage is 45.6 per cent. No sizing tests have yet been taken, since the machine has only worked for a short period and it has been found necessary to make some modifications. Further trials are, however, in hand, from which it is anticipated both finally to prove the machine mechanically and to obtain the necessary sizing data. One disadvantage already apparent is that when working in friable or weak coal, the block tends to break off short of the plough edge and become comminuted by the drum at floor level. The future application of this machine may, therefore, be limited to the tougher and stronger coals.

"Mawco" Frame Jib for Anderton Shearers

The basic design and principle of the "Mawco" head attachment was originated in Area 1 of the East Midlands Division by Mr. J. C. Mawson, Area mechanization engineer, and his staff. Essentially, as indicated in Fig. 4, it consists of a frame jib, the cutting section of which is set at right-angles to the machine, with the upper and lower sections leading the chain to the sprocket drive set parallel to the machine. The chain is thus bent sideways upon itself and the driving sprocket is mounted upon the shortened right-angled drum shaft.

For use in tougher and harder coals, provision is made to mount horizontally a breaker bar fitted with mushroom type picks upon the stub of the shortened shearer drum shaft. The chain used is of the single Hoy side-flexing ball-joint type. The kervings not carried through the cut by the chain together with the block of coal passing through the frame, are collected on the tray of the plough. The wedge action of the vertical face of the plough breaks up the block which, together with the kervings, is deflected up an inclined and curved ramp on to the armoured flexible conveyor.

The deflector plate of the plough is hinged vertically and can swing back upon itself, so that during the flitting operation any coal and gummings in the track are ploughed on to the conveyor. The tray of the plough is set to the width of the undercut and is open at the leading end, so that excess kervings are left at the floor beneath the plough and recovered on the flitting run.

A further feature of the plough is that the toe is hinged and set to fall to 1 in. below the floor level of the conveyor. Thus pick-up is positive and the cleanliness of the face after passage of the plough

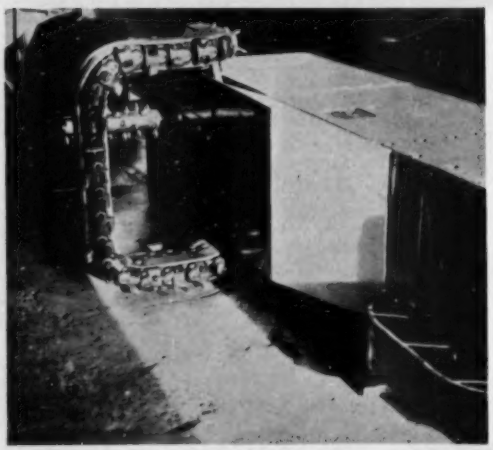


FIG. 4.—"MAWCO" FRAME JIB FOR ANDERTON SHEARER CONVERSION.

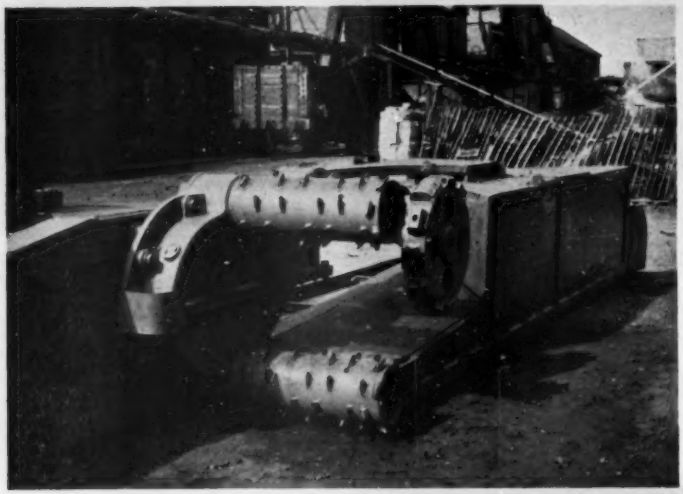


FIG. 5.—BJ-D LARGE-COAL SHEARER, WITH MAGNAMATIC CONTROL AND A WATER-COOLED MOTOR.

in the flit back is so good as not to require men cleaning up on the face side of the conveyor prior to pushing over. Where convergence between cutting and flitting may be troublesome, tending to fasten the frame, provision is made to mount a horizontal planing blade on top of the dividing section of the plough.

Operational speed of the machine has been up to 6 ft. 6 in./min. without stalling and early indications show a marked increase in +2-in. coal. This is achieved at some detriment to the 2-in.—½-in. sizes, but the ½-in. to 0 fraction is a 14 points improvement on the Anderton shearer and slightly higher than that for a trepanner in the same seam section. Further development work is proceeding in order to determine improvements in chain design and pick lacing with a view to reduction in the ½-in. to 0 fraction of the product, collapsibility of the frame readily and simply so as to broaden the application of the machine, and application of the principle to those machines having 3-deg. or 6-deg. angles of lag on the drum shaft.

Trials are also proceeding in three other Areas in the division in harder and tougher coals, with a view to shortening the period of development of the machine.

BJ-D Large-coal Shearer

This machine is arranged for mounting on a 24-in. wide, 7-in. high armoured conveyor and for cutting in one direction and ploughing back to its starting point, the usual stable holes being prepared at each end of the face. The general arrangement is illustrated in Fig. 5. The haulage unit employs the magnamatic principle of automatic control and the electric driving motor is water-cooled, developing 80 h.p. on a continuous rating. The cutting unit is arranged with two horizontal cutting elements and a vertical cutting element with a loading unit trailing closely behind the cutting unit, by means of which the coal produced by the cutting unit is transferred on to the face conveyor.

The two horizontal cutting elements take the form of drums disposed one above the other and spaced a maximum distance apart to cut at the top and bottom of the seam. The vertical cutting element is a rotating disc with picks displaced around its periphery and rotating about a horizontal axis. The vertical cutting element is dsposed at the outer ends of the cutting drums so that when the machine is travelling in a cutting direction the cutting drums and vertical cutting element extrude a rectangular piece of uncut coal which will break off in sizeable pieces. The loading unit trailing closely behind the cutting unit takes the form of a short belt conveyor running parallel to the working face.

Coal from the two horizontal cutting drums and from the vertical cutting element, as well as the extruded coal, is collected by the loading unit and transferred to the face conveyor. At the end of the loading unit, remote from the machine, a hinged ramp is fitted which is lifted clear of the floor during the cutting run to allow the free exit of coal which

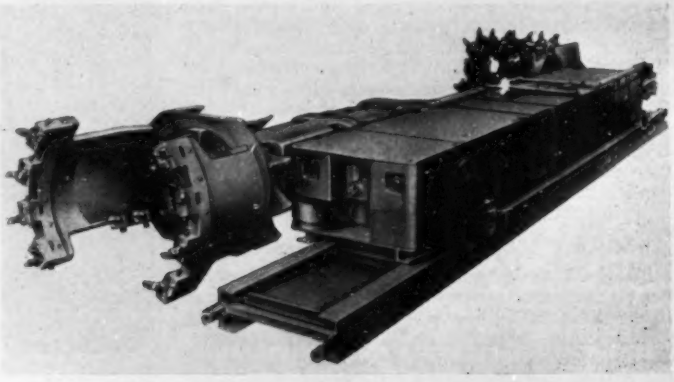


FIG. 6.—GENERAL ARRANGEMENT OF THE TREPAN SHEARER.

may accumulate beneath the bottom strand of the belt.

Before the return run, the ramp is lowered to floor level in order that it will collect and transfer to the face conveyor any coal left behind the machine during the cutting run. Trials of this machine are proceeding in Area 4.

The Trepan Shearer

The general arrangement of the trepan shearer is shown in Fig. 6. It is a development of the conventional shearer, the difference being that a core of coal is removed in advance of the shearer drum by means of a trepanning head. The shearer drum then serves to trim off the edges of the core to the height of the seam and depth of cut. The direction of cutting should normally be the same as that of the armoured conveyor in order to prevent the larger coal produced from the trepan-head having to pass underneath the body of the machine.

The trepan-head is driven from an additional gearbox mounted between the electric motor and hydraulic haulage unit. This gearbox drives an overhung side-mounted trepan unit which is adjacent to, and parallel with, the hydraulic haulage gearbox. All controls are side mounted on the goaf side of the machine which is uni-directional. The shearer drum is mounted at the opposite end of the machine and a conventional type of shearer plough is trailed behind the cutting elements.

Due to the overhung weight of the trepan unit and gearbox in addition to the shearer drum, provision is made to balance and steer the machine in a vertical plane by means of hydraulic jacking between the trepan gearbox and a curved floor plate rubbing along the profile of the base of the trepan cut. One machine has so far been on trial in a mine in the Scottish Division, as a result of which some modification is being made to steering and control gear.

In attempting to summarize the developments on the Anderton shearer, it is perhaps rather early yet to make final judgment on the approaches so far outlined to the design of alternatives to shearer drums. Nevertheless, the important trend in investigation and development of these alternatives has been established, and it is indeed hopeful that at least one, and possibly two of these, appear to bear reasonable promise of more universal application.

With all types of drum, one has little chance of maintaining a clean product in those seams having soft floors and/or one or more dirt bands of variable thickness in the seam. There is less contamination of smalls where cutting chains can be used in such designs as keep them clear of dirt bands, and more chance at the surface of removing larger sizes of dirt on the screens than in facing the problem of separating small dirt from coal in the washery.

British Iron and Steel Industry Translation Service

THE following is a list of some new translations available from the Iron and Steel Institute under its translation service scheme. Translations are all classified by numbers, and these should be quoted on application, which should be addressed to the institute at 4, Grosvenor Gardens, London, S.W.1. Further lists will appear from time to time.

BACKMAN, A.: *The Plastic Behaviour of Lime Mortar.* "Zement-Kalk-Gips," 1959 (10), pp. 449-456. £5 15s.—1500.

TSUMURA, S.: *The Reactive Capacity of Blast-furnace Slags for Sulphated Metallurgical Cement.* "Zement-Kalk-Gips," 1959, Sept., pp. 392-408. £7 10s.—1501.

ANON.: *Selection of Blowers for Cupolas.* "J. d'Inf. Tech. Ind. Fonderie," 1959, Jan., pp. 1-3. £1 15s.—1502.

HRIVNAK, I.: *Modification of Carbon Extraction Replicas for Austenitic Steels.* "Hutnické Listy" (Prague), 1959 (3), pp. 211-214. £4 15s.—1508.

MOLCIK, M., and M. KLESNIL: *The Use of Electron Microscopy for the Study of Kinetic Phenomena in Previously Selected Areas.* "Hutnické Listy" (Prague), 1959 (8), pp. 688-692. £5 15s.—1510.

RAVENET, P., and J. BOULEY: *Problems Relating to Wheels.* "Rev. Gén. Chemins de Fer," 1959, Nov., pp. 684-686. £2 5s.—1536.

LAPLAICHE, M.: *Problems Relating to the Braking of Trains.* "Rev. Gén. Chemins de Fer," 1959, Nov., pp. 687-697. £6.—1537.

GLAUBITZ, H.: *Appropriate Depth of Hardening in Surface Hardened Gear Teeth.* "Z.V.D.I.," 1958, Feb. 21, pp. 216-226. £8 15s.—1342.

EBERSPACHER, H.: *Cold Impact Extrusion of Steel.* "Werkstatt u. Betrieb," 1958, Oct., pp. 605-608. £3.—1467.

EWE, K.: *Measuring and Control Plant at the Experimental Converter of Phoenix Rheinrohr at Duisburg Ruhrort.* "Regelungstechnik," 1959, July, pp. 248-253. £3 10s.—1485.

GELEJI, A., *et al.*: *Tests to Determine Roll Forces and Power Requirements in a Mannesmann Oblique Rolling Mill.* Stahl u. Eisen, 1959, Sept. 17, pp. 1352-1356. £3 15s.—1490.

WALLQUIST, G., and J. C. CARLEN: *The Hot Torsion Test as a Method of Assessment of the Forgeability of Steel.* "Jernkont. Ann.," 1959 (1), pp. 1-28. £7 15s.—1495.

DETERT, K.: *Investigations of a New Kind of Secondary Re-crystallization in Iron—3 per cent. Silicon Alloy.* "Acta Metallurgica," 1959, Sept., pp. 589-598. £5 5s.—1543.

FUNKE, P.: *Fatigue Cracks in Composite Back-up Rolls for Cold Mills.* "Stahl u. Eisen," 1959, Oct. 1, pp. 1430-1431. £1 10s.—1560.

BUNGARDT, K., et al.: *The Effect of the Degree of Stabilization on the Precipitation Processes in Austenitic Chromium-nickel and Chromium-nickel-molybdenum Steels Containing Niobium.* "Arch, Eisenhüt., 1959, July, pp. 429-434. £4 10s.—1438.

KOLMOGOROV, V. L., and A. Z. GLEIBERG: *Study of Wall Deformation during the Hot Reducing of Tubes.* "Stal," Rolling and Tube Manufacture Supplement, 1959, pp. 171-179. £3 5s.—1481.

KRAINER, H., and E. KRAINER: *The Detection of Defects by Ultrasonic Testing.* "Schweisstechnik," 1958, Mar., pp. 28-32. £4.—1486.

Pig-iron and Steel Production

STATISTICAL SUMMARY

THE following United Kingdom pig-iron and steel statistics are issued jointly by the Iron and Steel Board and the British Iron and Steel Federation. Table 1 gives the production of pig-iron and ferro-alloys and the number of furnaces in blast in December, Table 2, production of steel ingots and castings in December, and Table 3, deliveries of finished steel in November, 1959. Table 4 summarizes activities of the industry.

TABLE 1.—*Average Weekly Production of Pig-iron and Ferro-alloys in December, 1959.* (*Thousands of Tons.*)

District.	Furnaces in blast.	Hematite.	Basic.	Foundry.	Forge.	Ferro-alloys.	Total.
Derbys., Leics., Notts., Northants., and Essex	18	—	24.4	21.6	0.8	—	46.8
Lancs. (excl N.W. Coast), Denbighs., Flints., and Ches. Yorks. (excl. N.E. Coast and Sheffield)	6	—	19.1	—	—	1.0	20.1
Lincs.	10	—	43.0	—	—	—	43.0
North-East Coast	16	1.8	58.4	—	—	—	60 2
Scotland	6	0.9	17.5	0.9	—	—	19.3
Staffs., Shrops., Worcs. and Warwicks.	5	—	8.7	0.9	—	—	9.6
S. Wales and Monmouthshire	10	2.5	55.4	1.3	—	—	59.2
Sheffield	2	—	3 4	—	—	—	3.4
North-West Coast	8	15.8	0.9	1.0	—	1.1	18.8
Total	81	21 0	230.8	25.7	0.8	2.1	280.4*
November, 1959	78	22 9	228.3	23 3	0.7	2.1	277.3
December, 1958*	84	20.4	177.3	22.9	0.1	2.4	223.1

TABLE 3.—*Average Weekly Deliveries of New Non-alloy and Alloy Finished Steel.* (*Thousands of Tons.*)

Product.	1957.	1958.	1958.	1959.	
			Nov.	Oct.	Nov.
Non-alloy steel:					
Ingots, blooms, billets, and slabs‡	5.0	4.6	5.7	4.9	6.6
Heavy rails	11.2	10.2	11.2	6.4	6.2
Sleepers	1.3	1.2	2.7	0.3	0.2
Fishplates and soleplates	0.8	0.7	0.3	0.5	0.2
Plates:					
(i) Over ¾ in. thick	34.0	29.6	25.8	29.3	28.7
(ii) Under ¾ in.	20.3	17.7	18.2	20.3	20.7
Other heavy prod.	53.0	41.8	31.7	51.5	53.9
Ferro-concrete bars	8.9	7.6	7.5	11.7	12.2
Wire rods	23.3	21.5	24.4	27.9	28.0
Arches, etc.	11.0	8.6	7.9	7.6	7.3
Other light sections	38.7	29.1	29.4	39.5	40.8
Bright steel bars	7.0	6.2	6.5	9.1	9.4
Hot-rolled strip	23.1	22.6	24.5	31.3	32.9
Cold-rolled strip	7.1	7.0	7.3	9.7	9.9
Sheets, incl. coated:					
(i) Hot-rolled	13.0	10.6	9.9	13.8	13.8
(ii) Cold reduced	29.1	31.1	35.2	39.4	38.4
Tinplate:					
(i) Hot dipped	11.3	8.4	9.4	7.2	8.8
(ii) Electrolytic	7.5	10.3	12.7	14.1	14.7
Blackplate	1.0	0.8	0.8	0.8	0.9
Tubes up to 16 in.	22.1	19.0	20.9	25.4	26.2
Tube fittings, etc.	0.5	0.4	0.4	0.5	0.5
Tyres, wheels and axles	5.1	4.5	3.8	2.0	3.3
Forgings (excl. drop)	3.1	2.6	2.4	2.2	2.3
Steel castings	4.6	4.2	3.9	3.8	4.1
Tool steel, etc.	0.3	0.2	0.2	0.5	0.3
Total	342.3	300.5	302.7	359.7	370.3
Alloy steel	17.8	16.1	15.0	21.7	22.7
Total deliveries from UK production†	360.1	316.6	317.7	381.4	393.0
Add: Imported finished steel	9.6	7.1	5.5	7.8	9.6
	369.7	323.7	323.2	389.2	402.6
Deduct: Intra-industry conversion§	48.2	41.2	42.9	54.4	55.8
Total new material	321.5	282.5	280.3	334.8	346.8

† Includes finished steel made from imported ingots and semis.
‡ Other than for conversion into any other form of steel listed.
§ Material for conversion into other products also listed.

TABLE 2.—*Average Weekly Production of Steel Ingots and Castings in December, 1959.* (*Thousands of Tons.*)

District.	Open-hearth.		Bessemer.	Electric.	All other.	Total.		Total ingots and castings.
	Acid.	Basic.				Ingots.	Castings.	
Derbys., Leics., Notts., Northants., and Essex	—	4.7	16.2 (basic)	2.5	—	22.0	1.4	23.4
Lancs. (excl. N.W.Coast), Denbighs., Flints.,Ches. Yorks. (excl. N.E. Coast and Sheffield)	0.9	33.1	—	4.4	0.3	37.4	1.3	38.7
Lincs.	—	47.4	—	—	0.1	47.4	0.1	47.5
North-East Coast	0.9	87.9	—	1.2	0 3	88.8	1.5	90.3
Scotland	1.0	43.5	—	2.7	—	45.3	1.9	47.2
Staffs., Shrops., Worcs., and Warwicks.	—	21.1	—	3.7	0.8	23.8	1.8	25.6
S. Wales and Monmouthshire	1.7	85.2	14.2 (basic)	0.8	0.1	101.6	0.4	102.0
Sheffield (incl. small tonnage in Manchester)	6.7	31.8	—	12.7	0.3	49.7	1.8	51.5
North-West Coast	—	—	6.0 (acid)	0.6	0.1	6.6	0.1	6.7
Total	11.2	354.7	36.4	28.6	2.0	422.6	10.3	432.9
November, 1959	14.1	377.1	33.3	32.0	2.1	447.6	11.0	458.6
December, 1958*	9.7	263.7	19.2	18.8	1.7	304.5	8.6	313.1

TABLE 4.—*Iron and Steel Index and General Summary of Pig-iron and Steel Production.* (*Weekly Average in Thousands of Tons.*)

Period.	B.o.T. Price Index, 1938 = 100.			Iron-ore output.	Imported ore used.	Coke sent to blast-furnaces.	Pig-iron, ferro-alloys prod.	Scrap used in steel prod.	Steel (incl. alloy).			
	Iron and steel.	Coal.	Basic materials§						Imports.†	Prod. ingots, castings.	Delivrs. finished steel.	Stocks.‡
1957	328	488	537	325	303	270	275	220	14	417	322	2,580
1958	343	403	478	276	262	227	245	196	9	369	284	2,242
1959—Oct.	339	504	480	299	283	228	270	235	7	441	336	2,207
Nov.	339	504	483	299	291	234	277	247	9	459	348	2,195
Dec.	339	504	485	303	293	248	280	225	9	433	312	2,235

* Months contain five weeks, all tables. ‡ Stocks, ingots, semi-finished and finished steel, at the end of the years and months shown.
† Weekly average of calendar month. § Used in non-food manufacturing industries.

NACM CONFERENCE ACCOMMODATION

FOR the benefit of members of the National Association of Colliery Managers who plan to attend the 1960 annual conference, to be held at Southport (Lancs) from June 1-3, a list of the principal hotels in Southport is given below. When writing to book accommodation, members should state that they are attending the NACM conference.

Conference headquarters will be at the Palace Hotel, where there is only limited accommodation available. Bookings at the CLIFTON are already completed. Prices given in parentheses in the following list are approximate bed and breakfast charges. Asterisks denote licensed premises.

* QUEENS, Promenade (30s.); * ROYAL, Promenade (32s. 6d. to 35s.); * PRINCE OF WALES, Lord Street (37s. 6d. to 47s. 6d.); * SCARISBRICK, Lord Street (28s. 6d.); * BOLD, Lord Street (25s.); BRUNSWICK, Lord Street (29s. 6d.); CARLTON, Lord Street (25s.); TALBOT, Portland Street (19s. 6d.); WAVERLEY, Promenade (21s.); ST. IVES, 10, Albany Road (15s. to 18s. 6d.); STUTELEA, 15, Alexandra Road (14s. 6d.).

WATERSMEET, 7, Argyle Road (13s. 6d. to 18s.); EDENDALE, 83, Avondale Road (19s. 6d.); KELMSCOTE, 30, Bold Street (15s.); CRAGIE LEA, 38, Bold Street (21s. to 23s. 6d.); SUNNYSIDE, 2, Castle Walk (12s. 6d.); SPRINGBANK, 6, Church Street (16s. 6d.); CHRISTIES, 40/42, King Street (13s. 6d.); LORETO, 44/45, Promenade (17s. 6d.).

SUNNYSIDE, 78/80, King Street (15s. 6d.); KNOWSLEY, 2, Knowsley Road (17s. 6d.); EYREDENE, 8, Knowsley Road (17s. 6d.); WHITWORTH, 16, Lathom Road (16s. 6d.); GILTON, 7, Leicester Street (17s. 6d.); CRAIGEN-GILLAN, 11, Leicester Street (12s. 6d.); BARROWFIELD, 37, Leicester Street (17s. 6d.); HOLLY LODGE, 103, Leyland Road (17s. 6d. to 21s.); CECIL, 110, Leyland Road (17s. 6d.).

ARTHERLEY, 35, Princes Street (15s. 6d.); STELLA MARIS, 25, Promenade (16s. 6d. to 17s. 6d.); SOMERSET, 49, Promenade (20s. to 21s.); BOND'S, 51, Promenade (18s. 6d.); POMME d'OR, 58, Promenade (17s. 6d.); MONTROSE, 72, Promenade (17s. 6d.); ROSEDALE, 11, Talbot Street (14s. 6d.); SYCAMORE, 69, Talbot Street (15s. 6d.).

Swedish Ore to Germany

According to "Handelsblatt," Dusseldorf, an agreement concluded by West Germany with Swedish iron-ore producers provides for ore deliveries in 1960 of 7,200,000 tons. This is about the same quantity as for 1959, but more higher quality ore will be delivered, resulting in a slight increase in the average price. One half of the consignments will be on a c.i.f. basis and the other half f.o.b., the shipments being apportioned half in German vessels and half in Swedish ships.

General Hydraulic Equipment

A PARTICULARLY useful and attractive catalogue (No. 59) has been produced by John Shaw & Sons (Salford), Limited, hydraulic engineers, Salford (Lancs). It briefly describes and illustrates the range of equipment supplied by this concern, including presses, pumps, accumulators, intensifiers and valves, to mention a few.

Typical of a general-purpose heavy forging press for hollow bodies, crankshafts, and bars is the triple power downstroke type to give 3,500 tons, 2,330 tons, or 1,170 tons pressure, the maximum stroke being 7 ft. 6 in. A 250-ton motor-driven hydraulic press brake bends and folds steel plates into many different shapes for all purposes. A 465-ton scrap-metal baling press exerts a pressure of 254 tons vertically and 207 tons horizontally, the weight of a bale 3 ft. 6 in. by 1 ft. 6 in. by 1 ft. 6 in. being between 5 and 6 cwt., 12/14 bales per hour. A 200-ton briquetting press turns out sizes 7½ to 7⅞ in. by 4½ in., to 3½ in. by 2⅛ in. deep, weight of the press being 5½ tons.

For mining, a portable 150-ton belt splicing press can be provided, equipped with electrically-driven rotary oil pump or with a double hand pump for use underground. The total weight is 7 tons.

Other equipment includes a 50-ton pipe testing press, 100-ton bending press, also air-loaded hydraulic, and weight loaded accumulators, the latter having a working pressure of 2,000 lb./sq. in. The catalogue is generally well produced, having depicted in colour on the front cover a triple power downstroke forging and piercing press, and on the back cover a 1,000-ton two-column forging press.

Publications Received

THE following publications which have recently been received are acknowledged with thanks.

GEORGE COHEN 600 GROUP, LIMITED, London, W.12—"600 Magazine," Vol. 34, No. 148. INDUSTRIAL ASSOCIATION OF WALES AND MONMOUTHSHIRE, Cardiff—"Industrial Wales," December. BRIGHTSIDE GROUP OF COMPANIES, Ecclesfield—"Brightside News," Christmas. MAVOR & COULSON, LIMITED, Glasgow—"M & C Apprentices' Magazine," Winter. NATIONAL SOCIETY for CLEAN AIR, London, S.W.1—"Smokeless Air," Winter.

VICTOR PRODUCTS (WALLSEND), LIMITED—"Victor Magazine," December. BRADLEY & FOSTER, LIMITED, Darlaston—"Bradley's Magazine," Nos. 78 and 79. NORTHERN ALUMINIUM COMPANY, LIMITED, London, W.C.2—"Aluminium News," November. JOHNSON, MATTHEY & COMPANY, LIMITED, London, E.C.1—"Platinum Metals Review," January. IRON & STEEL TRADES CONFEDERATION, London, W.C.1—"Man and Metal," December. IMPERIAL CHEMICAL INDUSTRIES, LIMITED, London, S.W.1—"ICI Magazine," December. ENGINEERING CENTRE, Birmingham—"News Letter," December. SAMUEL OSBORN & COMPANY, LIMITED, Sheffield—"Hand and Heart Magazine," December. J. H. FENNER & COMPANY, LIMITED, Hull—"V-belt Journal," December. THOS. FIRTH & JOHN BROWN, LIMITED, Sheffield—"Firth Brown News," Winter. COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION, Chatswood, NSW—"Coal Research in CSIRO," No. 8. BROOK MOTORS, LIMITED, Huddersfield—"Brook Magazine," Vol. 21, No. 90.

Metallurgical Properties of Materials at Low Temperatures

CONTAINMENT of a liquified gas such as methane requires great skill on the part of the designing engineer and the fabricator, in that the materials employed and methods of construction are concerned with an extremely cold liquid which, if released, would become a highly dangerous flammable gas.

In the 32nd Thomas Lowe Gray Lecture on "Technical and Economic Aspects Covering the Ocean Transportation of Liquid Methane" presented to the Institution of Mechanical Engineers on January 27, Dr. John J. McMullen deals with some of the metallurgical problems involved.

Many materials, he states, including all metals, show an increase in strength properties such as hardness, fatigue limit and elastic limit as temperature is decreased. However, certain metals, particularly most steels (carbon and low-alloy), chromium, tungsten, molybdenum, vanadium, etc. (some of which are quite hard and brittle in commercially pure form) crystallize in a body-centred cubic lattice structure. This means that, by the recommended Charpy impact test, within a rather narrow temperature range these materials change from being ductile to being very brittle at lower temperature.

A group of metals which do not change in ductility or toughness as temperature is decreased are those single-phase metals that crystallize in a face-centred cubic lattice structure. Metals which fall in this category are copper, silver-brazing metal, cupro-nickel alloy, aluminium and certain of its alloys, gold, nickel, lead, platinum, and the austenitic and stainless steels. Of the latter, a recent publication has indicated that for low temperature use 2¼ per cent. nickel steel be used down to −75 deg. F., 3½ per cent. nickel steel to −155 deg. F., 9 per cent. nickel steel down to −320 deg. F. and 304 types and 304L stainless steel down to −452 deg. F.

It is recommended that, although almost anv of the United States 5000 series of aluminium alloys can be used, the toughest, 5456 aluminium, would probably be the best for low-temperature use.

Naturally, once a particular metal were selected for the containment vessel and associated piping, very meticulous design, fabrication procedures, inspection, and testing would be required. In the case of the other hydrocarbon gases, liquefaction is not necessarily the only way of containment.

Pressurization is also possible, and the metallurgical properties of a metal containment vessel are then less influenced by low temperature than by ordinary mechanical requirements.

Modernization of Forges

The full proceedings of the Conference on Modernization of Forges, organized by the British Iron and Steel Research Association in September, 1958, are now available on application to BISRA, 11, Park Lane. London, W.1 (price 10s. post free to non-members).

"Miniveyor" Speeds Stable-hole Extraction

A NEW Joy-Sullivan stable-hole conveyor, or "Miniveyor," has been designed to save manpower in making stable holes at the ends and in advance of mechanized longwall faces. Existing methods, often calling for hand-casting of coal are particularly inefficient on rapidly advancing faces, where delay in stable hole preparations can affect the turnround and reversal of loading machines and advance of conveyor gearheads and tailends.

Other applications of the new conveyor include use on initial drivage of breakthrough in bord-and-pillar operations, and on single unit faces for conveying rib-side coal adjacent to main gates where rib-side packs are required. Essentially, the Miniveyor comprises a lightweight, all steel belt-carrying frame of welded construction, with electric motor/

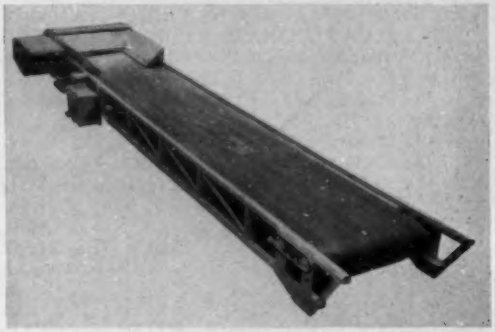


FIG. 1.—"MINIVEYOR" STABLE HOLE CONVEYOR.

drive pulley assembly at one end and an adjustable return pulley (for tensioning purposes) at the other.

The entire unit can be mounted on 8-in. castor wheels or skids allowing movement and positioning. A 2-h.p. motorized driving drum powers the conveyor, and is operated from a standard drill panel. Embodying its own electric motor and reduction gearing, the drum drives the belt at 175 ft./min., conveying coal at the rate of up to 50 ton/hr. A removable hopper is situated above the driving drum to facilitate coal filling.

Although the unit employs an 18-in. wide belt. carried on full length stainless steel strips positioned to give suitable troughing characteristics, the maximum overall width of the driving unit is only 2 ft. 8½ in. This is made possible by the arrangement of motor leads, which are led to a junction box mounted on the side of the conveyor. Overall standard length of the unit is 11 ft. 4 in., with drum centres at 10 ft., although various lengths may be specified between 8 ft. and 20 ft. 4 in.

Czech Mining School's Anniversary

The Mining College at Ostrava, in Czechoslovakia, which is one of the oldest in Europe, celebrated the 110th anniversary of its foundation recently.

INSTITUTION OF MINING ENGINEERS' EXAMINATIONS

Examiners' Report on Answers

COMMENTING on the final examination, held in November, 1959, for Associate Membership of the Institution of Mining Engineers, the examiners report a general improvement in the standard of candidates' answers. Some candidates, however, showed a marked tendency to avoid certain questions, indicating the need for students to extend their knowledge beyond the limits of formal lectures by reading. The comments of the examiners are summarized below for the benefit of future candidates for the examination.

Of the 47 successful candidates for Associate Membership, 36 also obtained the First Class Certificate of Competency, issued by the Mines Qualification Board, by passing in Mining Legislation. A further 12 candidates referred in Mining Legislation in previous examinations have now passed.

Organization and Management

The majority of candidates did well in the paper on organization and management, which permitted a wide choice of questions. An improvement is called for in the neatness of presentation of answers, and in a number of cases in the use of correct grammar and spelling.

The few candidates who answered Question 1 were all of the opinion that workers' participation would prove of more benefit than any attempt at workers' control. Most discussions were very limited. The benefits of large organizations in Question 2 were appreciated in most answers to this popular question, but the hazards of over-centralization could have been emphasized. Several of the organizational charts were very untidy. Little reference was made to the several important papers on this subject recently published.

Effects of the growth of oil competition on the coal industry were well discussed in Question 3, although only a minority of candidates were able to reinforce their arguments with correct statistics.

Types of company shares and the distinction between capital and revenue expenditures were in general understood in the answers to Question 4. Standardization of equipment to the optimum extent was favoured in most answers to Question 5, and many examples were described. Standardization of organizational procedures was one aspect frequently omitted.

Question 6 on method study was popular and in general well answered. While the functions of an industrial staff department were explained in most answers to Question 7, few detailed the necessary organization to serve a typical NCB Division.

Some candidates dealt far too much with the technical side of the tunnelling project in Question 8, with the result that the important items of planning, consultation with specialist departments, supervision, personnel selection, wages and incentives were only discussed briefly. Question 9 was popular and well answered by most candidates. Some omitted to note that it called for discussion of conciliation machinery at colliery level.

Principles of Mining—1

There was an improvement in the quality of candidates' work in this paper compared with previous examinations. A number of candidates, however, avoided certain questions to a noticeable degree. Students should be prepared for the examination so as to afford themselves the maximum opportunity of passing, and this cannot be done if certain sections of the syllabus are neglected.

The answers to Questions 3, 7, 8 and 9 were in many cases satisfactory. Questions in which mathematical principles were involved were poorly answered, particularly Question 2, where the second half, dealing with the minimum radius and superelevation of a curve, was often disregarded.

Principles of Mining—2

A good standard was reached in this examination in most answers, but Questions 5 and 9 were attempted by few candidates, and it would appear that preparation in these fields is not so good as in others. The scope of the syllabus is wide and candidates should extend their knowledge beyond the limits of formal lectures by reading. It should also be understood that questions will be concerned usually with basic principles rather than intimate operative or descriptive detail.

In many cases marks were lost because of illegible handwriting, incomprehensible statements or illogical deductions. Since all questions earn equal marks they generally require answers of about the same length. It is surprising to find a candidate writing seven or eight pages on one question and only one on another, and it is likely that in the first case irrelevant material has been included and in the second the answer is incomplete.

Answering Question 1, few candidates seemed to know that one of the first principles in planning a pit bottom is the efficient use of manpower, and from answers to Question 4 it was obvious that the meaning of "intrinsic safety" is not well understood. Question 6 on cross-measure drifting was often wrongly interpreted, although the wording

should have indicated the limits to be placed on the answer.

Pass List

The following candidates were successful in both the Associate Membership Examination and the paper on mining legislation:—

E. O. D. Agu, Stoke-on-Trent; G. W. Ashton, Hednesford (Staffs); T. E. Ashton, Pontypridd (Glam); J. G. Bailey, New South Wales, Australia; G. Barnett, Woodville, Burton-on-Trent; R. W. Bradford, Ripley (Derbys); G. A. Brown, Newcastle-upon-Tyne, 2; I. D. Dubey, Wigan (Lancs); J. Dugan, Wakefield (Yorks); N. S. Duhra, Bihar, India.

J. A. Duncan, Alva (Clackmanns); L. C. Evans, Swansea (Glam); P. R. Garrett, Whitmore Park, Coventry; A. Gibson, Drongan (Ayr); R. Hart, Swansea (Glam); J. Herrera, Risca (Mon); H. R. Hicks, Rhondda (Glam); A. Hindmarsh, Ashington (Northumberland); J. P. Jones, Walsall (Staffs); M. B. Jones, Coalville (Leics); P. A. Littlewood, Worksop (Notts); G. M. Lockhart, Tullibody (Clackmanns); D. Massey, Coalville (Leics); G. F. Mee, Ripley (Derbys); J. J. Morrow, Glasgow; G. R. J. Myatt, Calverton (Notts); P. Plows, Pontefract (Yorks).

S. S. P. Sinha, Bihar, India; E. Stirling, Kirkintulloch, Glasgow; J. D. Tankard, Swansea (Glam); D. A. Taylor, Mexborough (Yorks); E. Thomas, Cwmbran (Mon); J. K. Twaddle, Riggend-by-Airdrie (Lanarks); R. A. Whitehead, Walsall (Staffs); P. C. Widdowson, Mapperley, Nottingham; C. C. Windos, Porth (Glam).

The next examinations will be held jointly with those of the Mining Qualifications Board on May 18 and 19, 1960, at Cardiff, Doncaster, Glasgow, Stoke-on-Trent, Sunderland and Wigan. Forms of application and full particulars may be obtained from the Secretary, 3, Grosvenor Crescent, London, S.W.1. Last date for acceptance of entries is March 21, 1960.

World Energy Resources

THREAT OF OVERPOPULATION

WORLD and national energy resources were discussed by Dr. ALBERT PARKER, lately Director of Fuel Research, Department of Scientific and Industrial Research, in the course of his first Cantor lecture on "The Fuel and Power Industries and National Prosperity" delivered on Monday before the Royal Society of Arts.

Referring to world demands for fuel and power Dr. Parker recalled that world consumption of fuel and energy in 1958 was equivalent to 4,550,000,000 tons of coal, or an average of 1.6 tons for each individual of the population. Less than one-half, 46 per cent., was provided by coals and lignites, and 41 per cent. by petroleum and natural gas. Comparing the position in 1958 with that 20 years earlier in 1938, he pointed out that in 1958 world population was 30 per cent. more and world consumption of fuel and energy was 90 per cent. more than in 1938. Over that period, the quantity of coals and lignites used annually rose by 60 per cent., consumption of petroleum trebled, and the consumption of natural gas quadrupled.

Further, in 1958 the US consumed about one-third of the fuel and energy used in the world, including one-sixth of the coals, one-half of the petroleum, and four-fifths of the natural gas, though the population of the US is only one-sixteenth of that of the world. Over the years 1938 to 1958, the annual production in the USSR of bituminous coal increased from 113,000,000 to 353,000,000 tons, brown coal and lignite from 18,000,000 to 143,000,000 tons, petroleum from 28,000,000 to 112,000,000 tons, natural gas from 83,000 million to 1,000,000 million cub. ft. and hydro-electricity from 6,000 million to 46,000 million kWhr.

Future World Energy Demand

Discussing future world energy demand, the speaker pointed out that if world population and energy demand continued to increase at the same average geometric rate as during the last 20 years, then by the year 2000, or only 40 years from now, the population would reach about 5,000 millions and the annual energy demand would be equivalent to 17,500 million tons of coal; by the year 2100 the population would reach 18,500 millions and the annual energy demand would be equivalent to 435,000 million tons of coal.

In comparison with the population of 5,000 millions in the year 2000 as estimated by this method, a report on "The Future Growth of Population" issued by the United Nations in 1958 gave an estimate of more than 6,000 millions. Clearly, the unprecedented rate of growth of the population that had occurred since the beginning of the twentieth century could not continue. Two-thirds of the population were today under-nourished, and it seemed unlikely that in the foreseeable future sufficient food could be produced for a population greater than about 5,000 millions. If man was incapable of controlling population growth intelligently, then nature would exercise the control.

It followed, therefore, that it could not be assumed that the rate of increase in world energy demand that had occurred during the last few decades would continue for more than another few decades. There would be a substantial increase, but the known reserves of fossil fuels, hydro-electric potential, and nuclear fuels would ensure an adequate supply for the world as a whole, until further reserves were discovered and new and economic methods of generating energy and harnessing energy income had been discovered and developed. There would be occasional and particularly local shortages, but necessity was the mother of invention.

Total Gasification of Low-grade Fuels

EXPERIMENTAL GASIFIER FOR ELEVATED TEMPERATURE OPERATION

NOW in the course of development at Leatherhead by the gasifier division of Constructors John Brown, Limited, as part of Ministry of Power investigations into more efficient and economical means of producing gas from run-of-mine coal, is a pressurized coke gasifier. The fixed-bed continuous gasification system is characterized by the fact that it combines a high operating temperature with a high pressure.

At present, the development gasifier (Fig. 1) is operating at pressures of up to 8 atm. absolute, although it is anticipated that in time gasifiers of this type will be capable of working at pressures of up to 31 atm.

In the gasifier, coke, which is used to avoid problems arising from the volatile constituents of coal, is reacted with a mixture of oxygen and superheated steam to produce "synthesis gas," a carbon monoxide/hydrogen mixture which is a suitable basis for the synthesis of hydrocarbon fuels.

It is expected that a production gasifier of this type would be able to generate synthesis gas at a substantially lower cost than is possible using current methods. Ultimately, the gasifier's ability to convert all types of mined coal, together with its low gas cost, will make it attractive as a means of supplying town's gas and of making synthetic fuels and chemicals.

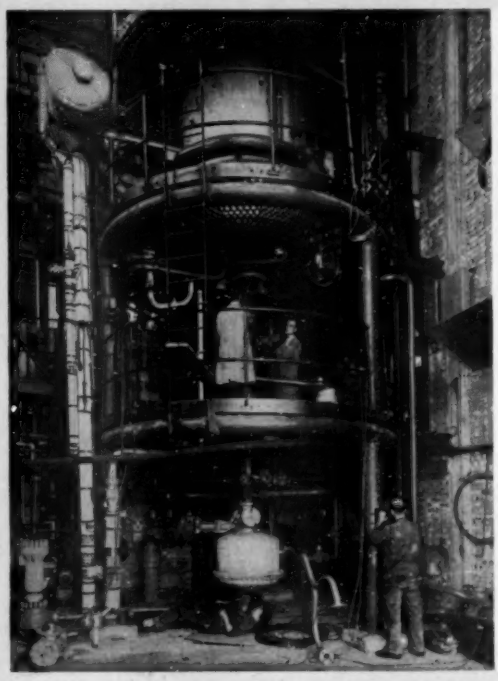


FIG. 1.—THE EXPERIMENTAL COKE GASIFIER BEING PREPARED FOR A TRIAL RUN.

Coke is "lock-hoppered" into the top of the gasifier, and the residual molten ash after gasification flows from the base of the vessel into a quench chamber within the pressure shell, at a temperature in the region of 1,500 deg. C. A major development problem has been the maintenance of a continuous flow of molten ash from the gasifier, and its removal from the pressure shell. After a number of trials, a hydraulic method has been devised which involves quenching the molten slag in a water bath inside the pressure shell; the resultant frit, suspended in the water, is discharged under its own pressure to a collecting hopper. Here, the frit is retained and the water drains away to a re-circulation system.

A proportion of the frit, however, remains suspended in the re-circulated water, which has to be re-introduced into the slag receiver against a pressure of about 100 lb./sq. in. Under these pressure conditions the suspended particles are exceptionally abrasive and it was, therefore, decided to instal a Megator GK3 pump set, supplied by Megator Pumps & Compressors, Limited, London, W.1, operating at a working pressure of about 130 lb./sq. in., and with a capacity of 5,000 gal. hr.

The Cooling System

At the high operating temperatures in the gasifier, cooling is a matter of considerable importance. To provide this cooling service two Megator K3 pumps have been installed as main and standby units. Injection of a make-up of cold water is accomplished by a set of three Megator M16 pumps, each with a capacity of 900 gal./hr. Each draws cold water from the storage tanks and injects into the high-pressure cooling system. Normally, only two of these pumps are in operation, the third being brought into use under extreme conditions.

It is expected to be several years before a fully developed pressure gasifier of this type could be built, using run-of-mine low grade fuels but it is possible that a gasifier using only coke as the fuel could be constructed somewhat earlier.

New Patents

THE patents below are among the complete specifications accepted listed in the "Official Journal (Patents)." The numbers given are those under which the specifications have been printed and all subsequent proceedings will be taken.

Applications for copies of the full specifications (3s. 6d. each, post free) should be made to the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.2.

Metallurgy and Engineering

823,419 SIEMENS & HALSKE G.M.B.H. De-gassing of molten metal by vibration or acoustic irradiation.
823,455 RIELLO F. LLI OFFICINE FONDERIE. Furnace lining.
823,493 INLAND STEEL COMPANY. Iron ore reduction process.
823,313 THOMAS & BALDWINS, LIMITED, R. Manufacture of silicon steel.
794,255 BRITISH IRON AND STEEL RESEARCH ASSOCIATION. Lubricators for use in the continuous casting of high melting point metals.
794,184 STRIKFELDT, W. S. Method of, and installation for regulating the temperature of hot blast produced in a recuperator by means of the waste gases from a shaft furnace.
824,485 COMMONWEALTH ENGINEERING COMPANY OF OHIO. Method of making corrosion resistant ingots or billets and corrosion resistant clad steel therefrom.
824,444 R-N. CORPORATION. Iron-ore reduction.
825,239 CONTROLLED HEAT AND AIR, LIMITED, and METALECTRIC FURNACES, LIMITED. Arc melting furnaces.
824,730 SHARON STEEL CORPORATION. Method of making cold-rolled stainless steel.
825,042 BIRMINGHAM SMALL ARMS COMPANY, LIMITED. Steels.
824,714 JOY MANUFACTURING COMPANY. Cable pull assist for self-propelled longwall mineral-mining machine.
825,087 DAUSSAN, H. J. Device and process for the casting of metals in ingot moulds or other moulds, and its applications.
824,979 KINZOKU ZAIRYO KENKYUSHO. Manufacture of ingots of non-ferrous metals and alloys.
824,683 BRITISH IRON AND STEEL RESEARCH ASSOCIATION. Pyrometers.
825,903 VACUUMSCHMELZE AG. Methods of treating silicon-iron alloys.
825,449 SCHWEISSWERK HALLE VEB., K. Method of electric-arc welding for the purpose of repairing and/or building up iron castings, such as case-hardened cast iron rolls and trunnions.
824,859 RUHRSTAHL, AG. Forged non-graphitic steel rolls.
825,692 VACCUMSCHMELZE AG. Method of treating silicon-iron alloys.
825,440 DOHMEN, H. Briquetting of ores.
825,293 WELLMAN SMITH OWEN ENGINEERING CORPORATION, LIMITED. Apparatus for the casting of metal ingots.
825,694 HÜTTENWERK OBERHAUSEN AG. Method of producing steel low in nitrogen.
825,187 COMPAGNIE DE PONT-A-MOUSSON. Ingot moulds.
824,826 VORKAUF, H. Cooled door frames for Siemens-Martin open-hearth furnaces or the like.
824,773 STAHLWERKE BOCHUM AG. Measurement of the magnetic properties of metal sheets.
825,232 SHIN-MITSUBISHI JUKOGYO KABUSHIKI KAISHA. Method of, and apparatus for combustion in a furnace employing oxygen.
824,881 BRITISH THOMSON-HOUSTON COMPANY, LIMITED. Rolling mills.
825,035 METALLGESELLSCHAFT AG. Seals for the gas hoods of sintering machines.
825,749 OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AERONAUTIQUES, ONERA. Methods for the treatment of metal articles made of refractory alloys.
825,847 OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AERONAUTIQUES, ONERA. Methods of forming superficial diffusion alloys containing chromium.
826,038 COAL INDUSTRY (PATENTS), LIMITED. Protective coating of light metals and alloys.

Fuel Treatment and Utilization

821,025 WESTFALIA DINNENDAHL GRÖPPEL AG. Devices for the automatic control of the medium density and of the medium level of the dense medium connected with washeries for coal, ore, and other minerals.
822,495 BRIKO N.V. Process for the manufacture of fuel briquettes.
823,852 DIDIER-WERKE AG. Charging of coke-oven chambers.
823,856 IMPERIAL CHEMICAL INDUSTRIES, LIMITED. Continuous casting of metals.
823,692 JEALOUS, E. M. E. Coal-screening devices for domestic coal storages.
823,754 STAMICARBON N.V. Low temperature separation of gas mixtures.
823,401 PRVNI BRNESKA STROJIRNA, ZAVODY KLEMENTA GOTTWALDA, NARODNI PODNIK. Furnace for the combustion of pulverized fuel.
823,530 WESTS' GAS IMPROVEMENT COMPANY, LIMITED, WEST, F. I., and WEST, E. Carbonization of coal.

Ignition of Explosive Gas Mixtures

RESEARCH REPORT No. 177, by D. RAE, and issued by the Safety in Mines Research Establishment, Ministry of Power, deals with the ignition of explosive gas mixtures by the friction between light alloys and rusted steel. This, the report indicates, depends on the formation and ignition of a thermite mixture. The reaction ignites fragments of alloy which are projected burning into the gas mixture and cause its ignition. Oxides other than rust also give gas ignitions, notably quartz with magnesium.

The ignition probability from the impact of an alloy-capped cylinder of given mass depends mainly on the height from which it is allowed to fall freely. It is modified, however, by the hardness of the alloy, the characteristics of the oxide target layer, and possibly by the humidity of the atmosphere and the water content of the target. Above certain limits the mass and shape of the weight appear to have little effect.

Relative incendivities of different alloys are compared by comparison of the heights of fall which, for a specified mass, give 50 per cent. ignitions. Titanium gives gas ignitions as readily as magnesium, but the sparking phenomena are different.

US Screens to be Made in Britain

OVERSTROM vibrating screens, which are produced in the United States, are to be manufactured under licence for the first time by Armstrong Whitworth (Metal Industries), Limited, of Gateshead. The British firm has the rights for manufacture and sales throughout the world, with the exception of the Americas and New Zealand.

The screens, which are suitable for installation in mines and quarries, are built for wet or dry, light, medium and heavy service. There are seven sizes ranging from 3 ft. by 18 in. to 16 ft. by 6 ft. and each can be equipped with one, two, or three decks. All screens can be fitted with partial or complete dust-proof enclosures, water-spray equipment, and heating units which are sometimes required for the finer mesh decks dealing with damp, sticky materials.

In the first British-made screen, no eccentric mechanism is involved to produce the rocking action. Vibration is set up by having unbalanced fly-wheels mounted at the ends of a plain shaft in the vibrator unit which is fixed rigidly on the screen box. Rotated at high speed, the flywheels set up in the spring-mounted screen a motion which is directly contrary to their own movement.

The amplitude of the screen rocking action is directly proportional to the amount of unbalanced weight in the flywheels and is independent of the speed of rotation. It can be adjusted to suit varying feeds by adding or removing the counterweights bolted to the inside of the flywheel rims.

Unlike many other screens of this type, no counter-balancing is necessary to prevent transmission of vibration to the supporting structure.

An important feature of Overstrom screens is that screening begins the moment the material is placed at the feed end—as opposed to a general "blinding" at this end before vibration begins to work about the centre of the screen. A forward elliptical motion at the feed end moves over-size material rapidly out of the way. In the centre, the action becomes a circular movement which slows down the rate of travel and, at the delivery end, a backward elliptical motion retards the flow and allows greater time for the near-size material to find openings in the screen cloth.

Substantial stripping of the supporting structure is unnecessary when replacing screen cloths. Patented stretcher-bar lifting springs automatically disengage the bar from the hooked edge of the screen cloth when exterior tension bolts are loosened, and the cloth can be withdrawn.

War on Want

DISTRIBUTED by Hugh Wood & Company, Limited, on the occasion of the War on Want Exhibition held at the Central Hall, Westminster, an illustrated booklet shows how Huwood products are making a contribution to raising standards of living.

Some of the sections are devoted to the following: (1) Belt conveyors; (2) shaking conveyors, getting and loading machines; (3) scrapers, retarders; (4) roof supports; (5) electrical equipment; (6) compressed-air equipment; (7) drilling auxiliaries, water infusion; (8) underground locomotives; (9) protective equipment, ventilating tubing; (10) surface and industrial conveyors. In addition to the large numbers of illustrations depicting various equipment, brief particulars in most cases describe the principal functions. The backgrounds of Huwood, geographical and technical, make interesting reading.

FORTHCOMING EVENTS

FEBRUARY 22

Royal Society of Arts: Meeting at the society headquarters, John Adam Street, London, W.C.2, at 6 p.m.: "Production and Treatment of Coals and Oils," the second of three Cantor lectures entitled "The Fuel and Power Industries and National Prosperity," by A. Parker.

Institution of Plant Engineers (Birmingham Branch): Meeting at the Hotel Leofric, Coventry, at 7.30 p.m.: "Modern Welding Methods," by R. T. Andrews.

FEBRUARY 23

Combustion Engineering Association (North-Western Region): Meeting at the Engineers' Club, Albert Square, Manchester, at 2.30 p.m.: "Refractories for Kilns and Furnaces," by N. W. Hinchliffe.

Institute of Marine Engineers (Northern Ireland Panel): Meeting at the College of Technology, Belfast, at 7 p.m.: "Metallurgy in Marine Engineering," by J. E. Garside.

FEBRUARY 25

Coke Oven Managers' Association (Northern Section): Meeting at the Three Tuns Hotel, Durham, at 7 p.m.: "Improvement of Metallurgical Coke Quality," by D. A. Hall and J. Gordon.

Society of Instrument Technology (Chester Section): Meeting in the premises of the English Speaking Union, Watergate Street, at 7 p.m.: "Automatic Control of Steel-rolling Mills," by W. N. Jenkins.

FEBRUARY 29

Royal Society of Arts: Meeting at the society headquarters, John Adam Street, London, W.C.2, at 6 p.m.: "Natural and Manufactured Gas," the last of three Cantor lectures entitled "The Fuel and Power Industries and National Prosperity," by A. Parker.

National Association of Colliery Managers

FEBRUARY 24

Lancashire Branch: Meeting at the offices of the North-Western Divisional Board, Manchester, at 4 p.m.: "Recent Experiences of Caving in the St. Helens Area," by J. Abbott.

FEBRUARY 26

Kent Branch: Meeting at the Swan Hotel, Deal, at 7.15 p.m.: "Some Recent Developments in Underground Mechanization," by A. G. Douthwaite.

FEBRUARY 29

Midland Branch: Special meeting at the new Technical College, situated at the junction of Derby Road and Nottingham Road, Mansfield, at 6.30 p.m.: "Mining Explosions."

Canadian Coal and Coke in 1958

THE continuing and increasing competition from oil and gas and the general recession of 1958 resulted in further contraction of the Canadian coal industry during that year, states the Department of Mines and Technical Surveys, Ottawa, in a summary of developments in the Canadian mineral industry for 1958. Production, at 11,621,984 short tons, was 11.9 per cent. lower than in 1957 and 39.3 per cent. below the 19,139,112-ton record of 1950. Production in 1958 was the lowest since 1912.

Of the total, Nova Scotia contributed about 45 per cent., Alberta 22, Saskatchewan 19, British Columbia and Yukon Territory together more than 7, and New Brunswick just under 7 per cent. Every province showed a decrease Whereas Nova Scotia, New Brunswick, Alberta, British Columbia and Yukon Territory had a collective decrease of more than 14 per cent. of their 1957 production, Saskatchewan's decrease was negligible. Alberta's change, the greatest in volume, amounted to a decrease of 20.4 per cent., bituminous coal accounting for 68 per cent. of the decrease. For the country as a whole, the production of bituminous coal decreased by about 15 per cent. and of sub-bituminous coal by about 11 per cent.

New Equipment and Products

Holman Rock Drilling Equipment

IMPORTANT additions have been made to the wide range of rock drills and compressed-air operated mining equipment manufactured by Holman Brothers, Limited, Camborne (Cornwall). They are the Silver Three Autostoper and Silver Three double-extension Autostoper, both embodying all the characteristics of the well-known Silver Three Handril which was used in a world tunnelling record advance of 557 ft. in one week.

More recently, in December, 1959, the British tunnelling record for drivages in coal measures was established by the National Coal Board at the Bank Hall Colliery, in the North-Western Division, using these machines. While working a seven-day week, 107 yd. of shale and sandstone were taken out of a 20-ft. by 12-ft. tunnel.

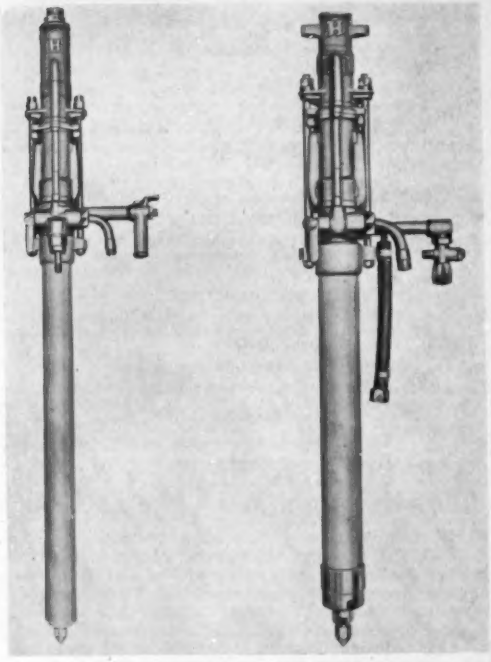


FIG. 1.—HOLMAN SILVER THREE AUTOSTOPER.

The compact Silver Three Autostoper has been developed from the standard Silver Three Handril, and is integrally mounted to the piston of the feed cylinder, a feed length of 31 in. being provided. The robust construction of this machine, its powerful rotation and simplicity of control, together with its high rate of blows, gives it particular advantage in meeting demands for increased footage.

A quick and easy positive feed control is provided on the control handle. Lubrication is by line oiler, special provision being made to ensure adequate distribution of oil to all working parts. The feed cylinder bore is 2½ in. and the length of the autostoper is 61½ in. when closed, weighing 86 lb. with a collared steel chuck.

The Silver Three double-extension Autostoper was originally developed to suit specific drilling requirements in Australia, where local conditions required the use of a stoper which would provide maximum feed with the shortest possible closed length. The new double-extension Autostoper successfully combines these two essential qualities and it has already acquired great popularity in Australia, notably at the Mount Isa mines and at Broken Hill.

Its closed length is only 51 in., enabling the operator to work in tight corners and to angle the Autostoper much more than can be done with a single extension machine. A feed length of 40 in. is provided which allows a considerable reduction in the number of steels used.

The feed is controlled within fine limits by means of a sensitive twist grip throttle. The double-extension Autostoper has 2⅛-in. and 2¼-in. feed cylinder bores. The length of the stoper is 91 in. when fully extended and it weighs 98 lb. with a collared steel chuck.

Vibratory Screens for Coal

A LONG and highly satisfactory record of service in the mining industry stands to the credit of "Niagara" vibratory screens, made by Niagara Screens (Great Britain), Limited, Clay Hill, Enfield (Middx). Machines supplied some 20 years ago, are still operating with maximum efficiency and require the minimum of maintenance. Although most of the units supplied to the coal industry are operating in the United Kingdom, the experience gained in all aspects of mechanical handling and screening has enabled this concern to develop a range of plant suitable for world-wide application, even under the most difficult conditions and with minimum maintenance.

"Niagara" portable plants have been usefully employed in open-cast coal production for a number of years. These plants are self-contained, being driven by either an internal combustion engine or electric motor.

The screens are convenient for treating coal after being in storage. A certain amount of degradation takes place in the previously graded coal, and to eliminate unwanted fines a special range of "Niagara" portable plants has been developed, incorporating single or double-deck machines as may be desired.

These units are now in use in many areas of the United Kingdom and by their speedy and efficient handling of stocked coal they are proving extremely economical to operate.

Development in Balances

FIRST of a new series of general purpose balances, incorporating analytical features, has been produced by Griffin & George, Limited, Ealing Road, Alperton, Wembley (Middx). Known as the Griffin Minor, it has a short beam for speedier weighing, single-limb bows carrying the weighing pans, an inclined scale which rises with the pointer, facilitating reading and avoiding parallax, a unique design in stirrups to protect knife edges, and a new design pillar allowing easy and rapid assembly.

The improved assembly of the agate bearings is important because they are held in position by positioning screws instead of being "drifted in" which is the usual practice. When the beam is arrested, all the agate bearings are relieved, giving longer life with students and in works control laboratories.

New Design of Motor

AN addition to its range of industrial motors is announced by the motor and control gear division of Associated Electrical Industries, Limited.

The new motor is designated Type KN-D and is of the squirrel-cage induction class, totally enclosed, fan-cooled, with ribbed frame and endshields. Class "E" insulation is used, permitting a maximum temperature rise of 65 deg. C. The machine complies electrically with BS 2613:1957 and its dimensions are such that it is completely interchangeable, rating for rating, with the ventilated (Type KN-C) BS dimension motor-built in accordance with BS 2960: 1958.

The use of the improved insulation makes it possible to offer a motor of smaller dimensions at a lower price than the earlier Class A insulated, 55 deg. C. rise, BS dimension machine which it replaces. The new motor is available in sizes up to 7½ h.p., but at a later date the range will be extended to 40 h.p. at 1,500 r.p.m.

Vibratory Conveyor

CLAIMED to be considerably cheaper than the conventional magnetic design, a new type of vibratory conveyor has been developed by Sinex Engineering Company, Limited, of North Feltham Trading Estate, Feltham (Mddx). It has all the advantages of the magnetic conveyor (except that it has a fixed rate of feed), *i.e.*, few moving parts, low maintenance requirements and silence of operation, and is adaptable where very little headroom is available.

Applications, for which the new conveyor is specially suited are those involving the simple transfer of material from one point to another; the feed can be stopped or started at will and although the speed of travel remains constant the level of material can be altered by means of a gate to control the feed.

The vibratory conveyor, the length of which is adapted to customers' requirements, comprises a feed trough fitted with a pair of the new standard SV range of Sinex electric vibrators, one on each side of the trough. The vibrators are mounted with their shafts in a vertical plane but inclined at a specific angle to provide a feed of material in one direction along the trough. Each conveyor can be supplied complete with base structure or with simple mountings for attachment to the customer's own equipment. The only moving parts employed are the rotors of the vibrators. Vibrators can be quickly replaced if this eventually becomes necessary, by virtue of their four-bolt lug mountings.

Direct-acting High-pressure Pump

DEVELOPED by Richard Sutcliffe, Limited, is a direct-acting water pump (Fig. 3) for use where water is required at high pressure. A typical and growing use for these pumps is the energization of ramming gear on armoured chain face conveyors, where use is made of mine water to which soluble oil has been added to minimise corrosion. The pump meets this need, and at the same time eliminates the cumbersome treble ram pump.

The pump is a self-contained power pack with an electric motor driving a rotary oil pump which supplies oil at pressure to a double-acting cylinder, the piston of which is connected to a yoke driving the piston of the water-pumping cylinder. As the oil cylinder is provided with an automatic instantaneous reversing valve, the delivery of water is maintained practically continuously and in an unvarying quantity. As the whole of the equipment is mounted on the power pack, movement as the face advances is a very simple operation.

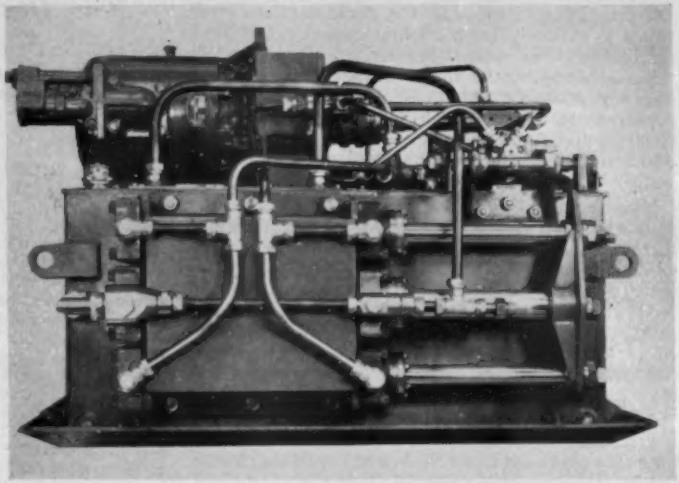


FIG. 3.—HYDRAULICALLY DRIVEN WATER PUMP FOR DELIVERY AT HIGH-PRESSURE SUPPLY.

The pumping equipment consists of a galvanized tank to hold 100 gallons of mixture, on top of which is mounted a 7½-h.p., 1,500 r.p.m. motor. The motor drives an hydraulic oil pump providing fluid to drive a reciprocating ram. The latter will reciprocate a water ram to give an output of 5 gal./min. at 1,000 lb./sq. in.

High-speed Screw Elevator

INTRODUCED recently by James Hodgkinson (Salford), Limited is a new high-speed screw elevator, designed primarily for handling boilerhouse smalls where it is not convenient, or possible, to prepare a concrete ground hopper or pit.

The elevator consists of a steel tube in which rotates a worm housed in totally sealed, self-aligning ball bearings and driven by a constant speed, totally enclosed motor mounted on a platform at the head of the casing. A short standard chute extends from the head to which an additional section or breeches pieces can be added, provision being made for this to be swivelled to suit site conditions. At the tail the worm is exposed for the entry of coal. An adjustable device enables the head to be supported from any convenient structure in the boilerhouse.

Each unit will handle up to 1½ ton/hr. of smalls, feeding direct to the stoker simply by resting the tail on a pile of coal and lifting the head into position over the stoker hopper. The elevator is self-cleaning, and no running maintenance is required since the bearings are grease packed and sealed for life.

The high-speed screw elevator is supplied in standard lengths of 13 ft., 14 ft., 15 ft., 16 ft., 17 ft., and 18 ft.

Tidal Water for Cooling During Drought

IN order to conserve public water supplies during the severe drought on Tees-side last September, Dorman Long (Steel), Limited, decided to use river water as make-up for a cooling system. The Tees is polluted with various industrial effluents and is tidal. During the height of the drought, when it seemed probable that Middlesbrough's water supply would be reduced to 10 per cent. of normal consumption, there was little fresh water coming down the river and an abnormal amount of sea water was therefore present.

The recirculating cooling system at the company's Acklam Iron and Steel Works incorporating turbine condensers, process cooling and a concrete cooling tower, operated with Tees water during the emergency period. This system normally uses approximately 500,000 gal./week of Middlesbrough's water for make-up. Cooling water is circulated through three turbo-blower condensers (two in service), and through the two operating blast-furnace tuyere and flat-block coolers. Cooling takes place over a concrete cooling tower.

Dorman Long discussed the treatment of the estuarine make-up water at Acklam with the Alfloc Water Treatment Service of Imperial Chemical Industries, Limited. Based on its experience of treating sea water on board ship, Alfloc recommended that its tannin/phosphate inhibitor, briquettes No. 60, normally used for treating recirculating cooling systems, should be supplemented with an alkali/tannin/organic surface active agent, briquettes No. 71, to prevent scale and corrosion. Treatment was initiated at 25 p.p.m. of Alfloc briquettes No. 71 and 15 p.p.m. of Alfloc briquettes No. 60.

Make-up and bleed-off from the system were adjusted to keep the number of concentrations carried in the system to less than 1.5 and the *pH* of the circulating water was kept between 8.0 and 8.3. Due to the fluctuating composition of the river water with the state of the tide, it was impracticable to control the number of concentrations directly by analysis. However, after assessing the evaporative loss over the cooling tower, it was found that adequate control was achieved by metering the make-up and bleed-off and keeping the calcium hardness in the circulating water below 1,700 p.p.m. in terms of $CaCO_3$.

Treatment was started on September 14, 1959, and continued until November 10, 1959, when the easing of Middlesbrough's water supply position enabled a start to be made in "freshening up" the system. During the emergency period the performance of the turbo-blower condensers was maintained and there has been no evidence of new scale being formed while the river water was in use at Acklam. With conditions maintained within the limits already described, treatment with Alfloc briquettes No. 71 at the rate of 25 p.p.m. and briquettes No. 60 at the rate of 15 p.p.m. was effective in preventing scale formation and corrosion in a recirculating cooling system using tidal water as make-up.

New Dressing Shop for Iron Foundries

NEW premises have now been provided to house the dressing shop serving the iron and non-ferrous foundries at the works of Lee, Howl & Company, Limited, Tipton (Staffs). The 60 ft. by 30 ft. shop is situated adjacent to the iron foundry and houses new, as well as certain existing, plant and equipment. The shop is designed to handle 1,200 tons of castings a year, the weight of castings varying from a few ounces to three tons.

One of the major items of new plant is a Spencer & Halstead shot blasting cabinet, 15 ft. by 10 ft. by 8 ft. This plant is equipped with a magnetic separator under the floor, so that if required de-coring can take place in the cabinet. The larger size castings are brought from the iron foundry on a bogey mounted on rails, which terminate in the shot blasting cabinet. Heavy castings are also handled in the shop by a 3-ton overhead runway chain hoist.

The shot blasting cabinet is fitted with a special glass roof and rubber lined walls, which reduce noise and plate wear. Next to the shot blasting cabinet is a new Spencer & Halstead Centriblast rumbling barrel for the smaller castings. The machine operates on an automatic cycle controlled by a time switch, the time cycle being 4 min. as against 4 or 5 hr. by previous methods. This machine has had the effect of cleaning the smaller castings more efficiently than any other previous means and, of course, in a fraction of the time. Dallow & Lambert dust extraction equipment is installed for the shot blasting cabinet.

Direct Rolling Processes in Powder Metallurgy

THE Powder Metallurgy Joint Group of the Iron and Steel Institute and the Institute of Metals will hold an informal discussion on "Direct Rolling Processes in Powder Metallurgy" in the Hoare Memorial Hall, Church House, Great Smith Street, London, S.W.1, on April 12.

Three papers will be presented at the morning session: "Some Mechanical Requirements of Plant for the Roll Compacting Process," by A. F. Marshall; "Continuous Compaction by Cyclic Pressing," by C. Deibel, D. R. Thornburg and F. Emley; and "Continuous Sintering of Copper-Lead to Steel," by J. K. Beddow and P. G. Forrester.

During the afternoon session, the following four papers will be given: "The Compaction of Metal Powders by Rolling. I—The Properties of Strip Rolled from Copper Powders," by P. E. Evans and G. C. Smith; "The Compaction of Metal Powders by Rolling. II—An Examination of the Compaction Process," by P. E. Evans and G. C. Smith: "Production of Pure Nickel Strip by the Direct-rolling Process," by D. K. Worn and R. P. Perks; "The Rolling of Copper Strip from Hydrogen-reduced and Other Powders," by D. G. Hunt and R. Eborall.

ELECTRIC SMELTING

Pilot Furnace for Contract Trials

FOR the first time in Britain a contract service is available for electric smelting. A pilot smelting furnace, built by Birlec-Efco (Melting), Limited, is now in operation at the company's Aldridge premises to promote the development of electric smelting processes. Customers' raw materials are accepted in trial batches for testing their amenity to electro-thermal reduction and for determining the most suitable smelting technique and the nature of the resultant products.

At a fee agreed in advance, the pilot smelting furnace, which provides full scale testing facilities, is operated on customers' raw materials. Finished products and the balance of materials are returned to the customer. The plant is of such a size that valuable information is gained on important factors such as power and electrode consumption, operating voltage, percentage recovery, and other relevant data.

This information can be scaled up so that a fairly accurate appraisal can be made of what can be expected on a large scale plant. At the end of the test Birlefco presents a full report giving recommendations on smelting practice, electrical ratings and size of installation required for a given output.

Pilot Smelting Furnace

The furnace, with a shell of 8 ft. internal dia., is situated at one end of a building specially designed and built for the purpose. It is surrounded by a charging platform at a height of 9 ft. from the main floor level. The furnace controls are suitably housed in a panel adjacent to the furnace operating platform.

With a nominal rating of 350 kVA, the furnace is designed to be as versatile as possible. A wide range of voltage tappings have been provided enabling, as far as practicable, the whole range of electric smelting applications to be covered. To determine the effect of shell rotation for different smelting operations, the shell can be rotated or oscillated in either direction at varyirg speeds.

Three tapholes are provided, the levels of which can be altered for slag and metal. They are served by a mono-rail beneath the platform, forming a loop surrounding the shell. The mono-rail carries slag pots or metal ladles.

Several thermo-couples are built into the refractory lining to monitor the temperature of the hearth and sidewalls at different points.

The furnace is equipped with holders suitable for 8-in. dia. electrodes which can be amorphous carbon or graphite according to the requirements of the tests. Smaller electrode holders can be fitted if necessary. The electrode clamps are arranged for remote control by pneumatically-operated cylinders.

Designed so that it can operate as an open-top furnace or with the top closed by the superimposition of a roof, the furnace is also arranged for fume removal or gas extraction. It is capable of smelting calcium carbide, iron ores, manganese ores, nickel and copper concentrates, and the production of ferro-silicon and ferro-chrome. It is also suitable for the treatment of slags and for many other electro-thermal processes.

Available to any company interested in carrying out tests on electro-thermal processes, the installation has laboratory facilities, and a competent staff to carry out the development work for which it is intended.

Layout of the Building

The building, specially designed to house the pilot smelting furnace, has a total floor area of 5,700 sq. ft. The main contractors for its erection were Robert M. Douglas (Contractors), Limited. It is served by a 5-ton overhead travelling crane, the maximum height of lift being 26 ft. The substation, which is integral with the main building, is in an area adjoining the furnace and platform.

Ample provision has been made for storage of refractories, electrodes and raw materials, and equipment for crushing, ladle heating and casting has been installed.

FIG. 1.—PREPARING TO TAP THE BIRLEFCO PILOT SMELTING FURNACE.

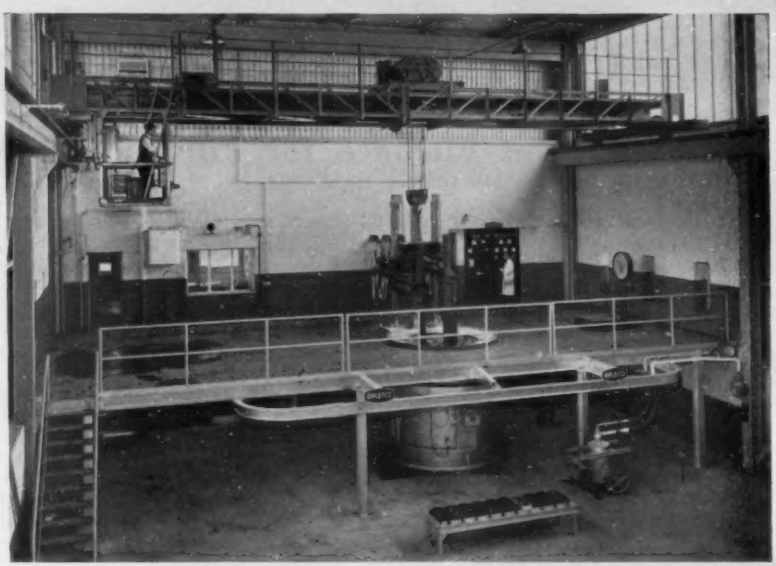


FIG. 2.—GENERAL VIEW OF THE PILOT SMELTING PLANT SHOWING OPERATING PLATFORM.

The sub-station, which is integral with the main building, houses the high voltage contactor, furnace transformer, 0.7-kW amplidyne electrode controller, and low tension distribution board.

Electrical Equipment

Transformer. — Nominally rated at 350 kVA, the BT-H three-phase transformer has an ancillary cooler enabling higher outputs to be attained for special smelting applications. Full output is available on all secondary tappings.

Power Supply.—Control of the power supply to the furnace is provided by a high voltage contactor, backed up by an oil circuit breaker which gives protection against short circuit and excessive overload. Under-voltage protection is provided in the contactor.

The Electro-thermal Smelting

An economical method of producing the very high temperatures required for the reduction of many ores is by the use of electro-thermal smelting. This method is also used where contamination of the product by ash in the conventional solid fuel process is undesirable. For certain metals and alloys it is accepted as the only economic process. The method is also gaining acceptance in the production of what are generally known as the "rarer metals" and other alloys.

Though accepted for over 50 years as a feasible method for extracting metals from their ores, only in recent years has electric smelting been carried out on a significant scale. The main factor contributing to this development is the relative cheapening of the unit cost of electricity when compared with other fuels.

Some Applications

Ferro-alloys.—The metals in this group, consisting of ferro-silicon, ferro-chromium, ferro-manganese, ferro-tungsten and others, are used as alloying agents in the production of special steels. In particular, ferro-silicon and ferro-manganese are essential for the deoxidation of steel.

Silicon.—Silicon metal with a purity exceeding 96 per cent. can advantageously be smelted in electric furnaces. The main use of silicon metal is as an alloying element for non-ferrous metals, in particular copper and aluminium. Silicon is also used as a reducing agent in the production of certain ferro-alloys. In recent years a new range of chemical compounds known as silicones has been developed on a large scale and finds application in such products as waxes and polishes.

Iron Smelting.—Where economic conditions are favourable, electric smelting furnaces for pig-iron production are installed in capacities up to 220 ton/day. The blast furnace is still the principal metallurgical equipment for producing pig-iron, but it depends for its operation on supplies of high-grade metallurgical coke. In countries where hydro-electric power is plentiful, and its cost compares favourably with that of metallurgical coke. electrically smelted pig-iron can be produced more economically than the blast-furnace product. Some 3,000,000 tons are produced annually throughout the world by this method.

Phosphorus.—Phosphorus is produced in its elemental state from phosphate rock in an electric smelting furnace, and is used in the production of the various phosphorus compounds required by industry, especially for fertilizers and detergents.

Non-ferrous Metals.—Under certain conditions, electric smelting furnaces can be used advantageously in processes concerned with the extraction of many non-ferrous metals, including copper, nickel, tin and zinc.

Although Birlec-Efco (Melting), Limited, is interested in the promotion of this furnace in Great Britain, it is felt that there is even greater scope oversea. The company also feels that a reduction in the price of electricity would make the use of the furnace more economic in this country.

In Parliament

NCB "BOOKS ARE NOT COOKED"

Ministers Refute Mr. Nabarro's Accusations

THIRD reading of the Coal Industry Bill, moved by the Minister of Power, Mr. Richard Wood, in the House on Tuesday, gave Mr. Gerald Nabarro (Con.) another chance to bring all his guns to bear upon the NCB in particular and nationalization in general—and he did not hesitate to take it. He repeated his accusation that the board was "cooking the books" and drew from the Minister the warning that he was not only making accusations against the NCB but also against the accountants.

The Bill provides for an immediate increase of the Coal Board's borrowing powers from £650,000,000 to £700,000,000 to enable it to carry out its proposed development plans. MR. WOOD tried to draw Mr. Nabarro's fire by dealing with calorific loss through stocking—a point made by Mr. Nabarro last week. He said the Scientific Advisory Council's advice, which was borne out by other countries, was that loss of calorific value was between 0.15 and 1 per cent. per year.

He went on: "There is nothing to be gained—economically, politically, or in any other way—from the inefficiency of any industry . . . but we do not intend to denationalize the industry. Therefore our object must be to help this and other nationalized industries towards greater efficiency. That is the object of the Bill."

Exercise in Deficit Financing

MR. NABARRO began his attack by saying the Bill was an exercise in deficit financing for a nationalized industry. The Parliamentary Secretary had had the impertinence to say that statements of that kind were wild. Time would tell who was "the wilder of the two of us."

The Parliamentary Secretary had outdone the Socialists themselves in his glib and specious reply. "It is not the taxpayers' money, it comes from the Consolidated Fund." Who furnished the Consolidated Fund? Mr. Nabarro asked. "At least I am purer in my Tory beliefs than the Parliamentary Secretary. He is more Socialist than the Socialist Front Bench itself."

Of coal stocked, 16,000,000 tons was unscreened, unwashed, low-grade coals with a high ash content. It was manifest nonsense to say that such coals deteriorated by only 1 per cent. per year. "I am quite sure the NCB is cooking the books by writing into its accounts a sum of £141,000,000 for stocks," Mr. Nabarro declared.

Pressed by MR. JAMES GRIFFITHS (Lab.) to refute "this grave charge," the MINISTER reminded Mr. Nabarro of the seriousness of his accusations and MR. BERNARD TAYLOR (Lab.) challenged Mr. Nabarro to make his accusations outside as well as in the privileged House.

MR. NABARRO persisted: "I am conscious of the heavy responsibility which rests on my shoulders. I believe that the cost of these stocks is very much lower and the market value is certainly much lower than the figures that the board has written into its accounts." He believed the board was seeking to minimize its losses forward and that when the true evaluation of the stocks was taken—when they were sold, if ever,—and they had to be sold at a gravely written-down figure, then the losses would be greatly enhanced. He would not vote against the third reading because part of the increased borrowing powers were necessary to the board.

MR. SYDNEY SILVERMAN (Lab.): "If the Bill provides for borrowing money on a fraudulent prospectus why does not Mr. Nabarro vote against it?"

MR. NABARRO: "The trouble is that the whole of nationalization is a fraudulent prospectus."

Winding up for the Opposition MR. GRIFFITHS could not resist a dig at the Government—"Compared with the venom with which these Tories attack each other, controversies in the Labour Party are not in it. Cooked accounts, cooked books, and Ministers who do not tell the truth! Well, what a revelation to the country," he gibed.

He went on to say that they must do everything they could to help the coal industry. Give the miners a square deal and they would give a square deal to the nation.

Replying to the debate MR. JOHN C. GEORGE, the Parliamentary Secretary to the Ministry of Power, said it was right to recognize—it was churlish not to do so—that some of the results of greater efficiency were now coming forward. He would give the Coal Board credit when he thought it was due, and he would not be restrained by anyone calling that a Socialist attitude.

It had been argued by Mr. Nabarro that this was a case of endless borrowing without profitability, but the Coal Board had said its objective was to secure a substantial reduction in the accumulated deficit over the period 1960-65 by improved productivity and reductions in costs. It seemed obvious that improvements in productivity would be forthcoming and that was what was needed to square the books and not cook the books.

Output had to be limited this year. It was a morale destroyer and most inadvisable action to take if management had to be told to go slow on productivity, but it might have to be done because the board intended no more stocking would be done in 1960.

Estimating future possible demands for coal was treated as an extremely serious matter, both at the board and the Ministry. The board did not simply pluck figures out of the air and throw them before the chairman. Mr. Nabarro had made some serious charges and had said that loans made to the board

were ultimately payable by the taxpayer. That was absolutely wrong.

Mr. Nabarro had charged the Minister with deficit financing. It would be illegal for the Minister to indulge in that. The deficit of the board would be financed by the reserves within the board itself and not by the Minister. Mr. Nabarro, who had charged the board with cooking the books, should give that matter serious concern. He was not only charging the board but the board's accountants. It was extremely regrettable.

Coal Distribution

NO general direction could be given to the National Coal Board to employ unemployed miners for the purpose of distributing coal from the pits directly to household consumers, nor would he ask the NCB to investigate a household coal distribution service in all districts immediately adjacent to pit areas, the MINISTER OF POWER, Mr. Richard Wood, told MR. JOHN MCKAY (Lab.).

MR. MCKAY said that in most districts the householder had to pay £3 to £4 a ton more than the pithead price. The Coal Board should do it and give housewives their coal a little cheaper and provide more employment for the men in the coalfield.

The prices charged by the NCB selling direct were not substantially different from the prices by other coal merchants and distributors, the MINISTER replied.

Three Labour and Co-operative members, MR. NORMAN DODDS, MR. GEORGE DARLING, and MR. WILLIAM OWEN, asked the Minister for a statement on the present general difficulty in obtaining household coal. There was no general shortage, the Minister replied. Transport difficulties might cause certain local difficulties.

MR. DODDS: "This morning, coal merchants told me that coal which had left Midland collieries on December 4 had not yet been delivered in south-east London."

MR. WOOD: "I am told that merchants' stocks at this moment are just about normal; they are just about the same as they were in other years."

MR. DARLING would not admit that it was a Coal Board matter. Part of the trouble was that merchants were still using old-fashioned handling methods. The time had come to get a proper system of distribution at the merchants' end.

MR. WOOD said he would speak to the Minister of Transport about the transport side of the difficulty, but the real problem was that there was a shortage of suitable operating staff for the wagons that were available.

SULPHUR FROM OIL AND COAL

WORRYING away at the sulphur emission from fuel oil, MR. WOODROW WYATT (Lab.) again taxed the Minister of Power on the subject when he asked that installations burning fuel oil from Middle East sources should not be automatically exempt under the Clean Air Act. He quoted Los Angeles legislation and maintained that 70 per cent. of the oil burnt in this country contained 3 per cent. of sulphur, double the amount in coal. "People are being poisoned by the emission of oil fumes permitted by the Minister of Power at the same time as the coal industry is being ruined," he said.

The MINISTER, Mr. Richard Wood, agreed that sulphur was most obnoxious, but said that there was no present prospect of substantially reducing the emission of sulphur oxides from general industry or domestic fires. As Mr. Wyatt knew, a ton of oil did the same work as 1½ or 2 tons of coal and, therefore, there was really no reason to believe that oil burning produced more sulphur than coal.

MR. WYATT retorted by pointing out that most of the sulphur from coal remained in the ash, but that from burning Middle East oil went straight out into the atmosphere "killing people every day."

NCB's EXTRA LIABILITIES

AFTER MR. RICHARD WOOD, the Minister of Power, had told MR. BERNARD TAYLOR (Lab.) the amount of the liability transferred to the NCB from the Coal Commission set up under the Coal Act, 1938, when coal deposits became public property, was £78,457,089 at a yearly interest rate of 2½ per cent., MR. JAMES GRIFFITHS (Lab.) said £78,000,000 was not the actual figure. The NCB since then had had to accept extra liabilities which should have been placed on the former owners.

MR. WOOD, replying, said it was an ordinary liability placed on any business which operated with borrowed capital. There could be no question about the rectitude of the figure or the moderate rate of interest at which it had to be repaid.

In a written reply to Mr. Taylor, the Minister stated that the amount paid in interest was £23,775,891 to December 31, 1959, when the outstanding liability was £66,271,798. The annual amounts of interest paid had decreased from £1,961,427 in 1947, to £1,683,855 in 1959.

HOT-FOOT TO WINDSOR CASTLE

WHEN the MINISTER OF POWER, Mr. Richard Wood, said that he was advised on the relative merits of heating by coke, coal, or oil, by his Scientific Advisory Council and his Fuel Efficiency Advisory Committee, MR. WOODROW WYATT (Lab.) suggested he sent them hot-foot to Windsor Castle to prevent the conversion of the coke-burning heating installations to oil. "If the conversion takes place, it will be a disastrous blow to the miners who may think that in these dangerous days for the coal industry even the Queen has turned against them," he said.

MR. WOOD thought his advisers might be trespassing if they went to Windsor Castle.

A similar question was put by MR. WYATT to the Minister of Works on Tuesday. The PARLIAMENTARY SECRETARY TO THE MINISTRY, Mr. Harmar Nicholls, said that after careful consideration of all the circumstances some time ago, an oil-fired installation had been decided upon. It was some months since the contract had been let and the work was too advanced to consider changing the system.

Why had not his Ministry consulted the Ministry of Power before the arrangement was made? Mr. Wyatt asked. It was still possible to convert the system to coal—or coke-burning without any increase in expenditure.

Mr. Nicholls replied that the structure of Windsor Castle, the availability of a storage place for coal, and questions of amenity all showed that an oil installation would be the most satisfactory.

MACHINE-TOOL INDUSTRY

DISCUSSION on the recommendations of the Department of Scientific and Industrial Research's report on the machine-tool industry was going on between the DSIR, the Machine Tool Trades Association, the Board of Trade, and the Ministry of Educa-

tion, SIR DAVID ECCLES, Minister of Education, replied to a question by MR. AUSTEN ALBU (Lab.).

MR. ANTHONY GREENWOOD (Lab.) suggested that a body should be set up to inquire into the industry, an inquiry whose proceedings and evidence would be fully published.

SIR DAVID: "It would be better to see the progress we can make with what is happening now, which I understand is likely to be good."

THE ANNUAL DSIR GRANT to the Shipbuilding Research Association for the year ended March 31, 1959, was £50,000. For the current year it would be £60,000 provided that £300,000 was raised from industry.—The Minister of Education.

IN ENGLAND, 1,504, 2,236, and 1,842 ex-miners had been recruited for the Army in 1957, 1958, and 1959, respectively, said Mr. Christopher Soames, Secretary of State for War, who told Mr. William Hamilton (Lab.) that the corresponding figures for Scotland were 328, 391, and 471.

SIX VOYAGES had been completed by the Methane Pioneer, carrying liquid methane to the UK. The average coal equivalent of each cargo was about 4,500 tons, the Minister of Power stated in a written reply to Mr. Harold Neal (Lab.). He knew of no preparations to build ships similar to the Methane Pioneer.

NCB Rebuts Mr. Nabarro's Criticisms

GRAVELY concerned that statements should be made which appeared to cast doubt on its integrity, the National Coal Board has taken the somewhat unusual step of issuing an official statement rebutting the criticisms made by Mr. Gerald Nabarro, MP.

The statement points out that according to Hansard, Mr. Nabarro stated that the board has been "cooking the books" by overstating the value of the stocks, that it has not followed widely accepted accountancy practice in valuing the stocks, and that the stocks included a lot of coal which was unsaleable.

Taking the earliest opportunity to show that the allegations made are without foundation, the board says: "Past experience and scientific investigation show that generally coal stocks deteriorate only slightly and the board is satisfied that it has made full provision for any deterioration which may occur. In valuing the stocks in its accounts, the board has followed sound accounting practice and its accounts are audited and certified by a leading firm of professional accountants. The published accounts for the year 1958 showed that the stocks held at the end of that year had been valued at figures £17,000,000 below the current market prices (at pithead) of the various qualities of coal and coke. The stocks increased during 1959 and the accounts for that year are expected to show that the stocks at the end of the year were valued at figures £32,000,000 below market prices.

"The board emphasizes that far from being unsaleable the coal held in stock is of the same grades and qualities as are being sold week by week in large quantities. The biggest stocks are of cleaned small coals, of which the board is currently selling nearly a million tons a week. In the first five weeks of 1960, the board lifted and sold from stock 1,300,000 tons of the various grades and realized prices in excess of the values shown in the accounts."

Kent Colliers End Stay-down Strike

ALTHOUGH sympathetic strike action with the men of Betteshanger Colliery (Kent) was rejected by workers in the coalfield's other three collieries, they accepted on Tuesday the recommendation of the Kent Area of the NUM to help the strikers at Betteshanger. Over 120 men staged a stay-down strike on Wednesday of last week as a protest against the NCB's proposal to issue redundancy notices to 140 employees, many of them under 21.

The NUM recommendation was a levy of 2s. for underground workers and 1s. for surface workers, suspension of recruitment, cessation of handling stock coals, and no acceptance of transfers from one colliery to another without NUM branch consultation.

On Saturday a deputation consisting of the union branch chairman, Mr. L. Magness, the secretary, Mr. J. Burke, and two men who had been underground since the strike began, was received by Mr. J. H. Plumptre, general manager of the South-Eastern Divisional Coal Board, Mr. N. Smith, its secretary, and Mr. D. J. Evans, industrial relations officer. The men offered an immediate return to work if the board would suspend the redundancy notices so that the need for redundancy could be discussed. The board was not prepared to do this, but said it would be prepared to discuss the method of implementing redundancy when all the men resumed work.

To the somewhat ironic strains of "Keep the Home Fires Burning" played by the Betteshanger Prize Silver Band the men, who had been brought to the surface on Wednesday by their union branch, marched to the pithead baths. Mr. Magness said there was no purpose in keeping them down any longer now that a degree of unity had been obtained with the other Kent pits. The strike would continue.

In a letter in The Times yesterday (Thursday), Mr. Plumptre denies suggestions that the 140 men were dismissed summarily with indecent haste. They were given two weeks' notice after nearly three months' negotiations and, as the NUM had insisted, those declared redundant were those most recently engaged.

The general manager refutes the allegation that the Betteshanger men were "scapegoats" and that miners were being treated as "cogs in an inhuman industrial machine," comparing the handling of the present national situation with that of 1932 when 350,000 were unemployed.

The South-Eastern Division was faced with overproduction and losses of around £300,000 a year (before charging interest) and the problem of redundancy at Betteshanger had been discussed with the union at pit, divisional, and national levels. The union, he states, had not at any time opposed the reduction in output and manpower in Kent, the sole issue having been whether or not the men should be made redundant.

ELEVEN MEN with an aggregate of 550 years' service at Grimethorpe Colliery (Yorks) received gratuity cheques from the manager, Mr. G. H. Lockwood, at a ceremony on Saturday. They are the first of 62 employees there to be immediately affected by the new scheme for compulsory retirement at the age of 65. The men also received long-service badges from Mr. G. R. McQueen, treasurer of the local branch of the NUM.

Non-ferrous Metals

Probable Drop in Copper Prices

THE prolonged strike in the US copper industry is now virtually settled, the only important gap in the peace settlement being at the Phelps Dodge Laurel Hill, New York, copper refinery where peace is likely at any moment. The London market, which at one point last week opened at £280 a ton, has now fallen back to just below £270.

In London demand is good from all sources and, with the knowledge that despite the peace settlements physical copper is in short supply and stocks have been run down severely, the quotation for cash copper is holding up well. This position may well hold for some time, but the size of the backwardation at around £20 a ton—it was nearly £30 a ton—indicates the size of the expected drop in prices in the not too distant future. However, stocks in London are less than 4,000 tons and the outlook must be for a decent, orderly retreat of the cash price and a closing up of the backwardation as the US industry gets into its stride.

In the US demand is good and so far there has been no change in the price structure, with producers quoting 33 cents and custom smelters 35 cents a pound.

Tin is a good market in London, in the East, and in New York, where the price is around $1.01 a pound. In London the market remains quietly steady, the price experiencing only small variations around £793 a ton. The Singapore quotation is strong due to direct US buying, mainly from the tinplate industry, and this has brought a good deal of satisfaction to the ITC, which had come under fire for raising the export quotas to what many had thought too high levels.

Some observers have voiced their opinion that 1960 may see the world offtake for tin exceeding production. If this materializes it would probably mean that the buffer stock manager would have to sell his entire stock or come under heavy criticism for not doing so.

Lead is quiet on both sides of the Atlantic. In London the turnover has expanded, but the arrival of metal from the Continent continues to keep the price down. At present the quotation for cash metal is over £74 a ton and the outlook is for it to stay around this level for the immediate future. In the US the market is quiet and the price is unchanged at 12 cents a pound.

Zinc continues to be a good market, both in London and in New York, particularly for special high grade metal. The statistical position is sound and in London the price is trying hard to break through to £90 a ton. In the US the price is unaltered at 13 cents a pound.

Official metal prices in London yesterday (Thursday) were:—COPPER, Standard: Prompt £269, forward £249 10s. TIN, Standard: Prompt £793 10s., forward £794 10s. LEAD: Prompt £74 12s. 6d., forward £74 15s. ZINC: Prompt £86 15s., forward £87 10s.

A TOTAL of 96,031 tons of coal was shipped through the port of Garston, Liverpool, in January, of which 70,021 tons went to Northern Ireland, 22,002 tons to Eire, and 3,623 tons to the Isle of Man, the remaining 385 tons being foreign bunkers. The month's coke shipments totalled 6,697 tons, of which 427 tons went to Northern Ireland. The remainder consisted of foreign coke (6,270 tons).

English Electric Group Results

A FINAL dividend of 7 per cent. to make 10 per cent. for 1959 on a capital increased from £18,270,000 to £30,140,000 by one-for-10 rights and one-for-two scrip issues, is announced by the English Electric Company, Limited. This compares with the equivalent of 9¼ per cent., taking the scrip issue into consideration. After heavier depreciation group profits dropped to £6,734,725 (£7,017,638), but due to a lower tax charge the net balance attributable to the parent company is more than maintained at £3,125,870 (£3,017,258).

Among other members of the group, Vulcan Foundry Limited, showed a further marked improvement in 1959 with group profits expanding to £435,784 (£125,780), after charging depreciation of £160,068 (£118,780). UK tax takes £211,000 (£50,000) and general reserve is allocated £49,000 (£25,000) in respect of tax relief on capital allowances, leaving a net profit of £175,784, compared with £50,780. The dividend is unchanged at 5 per cent.

D. Napier & Son, Limited, aero and marine engineers, reports a loss of £1,188,369 on trading account for 1959. Deducting a subvention payment from English Electric of £1,200,000 there is a surplus of £11,631, against a previous profit of £242,543 after a depreciation charge of £316,749 (£511,906). No dividend is recommended on the ordinary, all held by the controlling company, against 7½ per cent. for 1958.

Marconi's Wireless Telegraph Company, Limited, another member of the English Electric group, announces group profits of £900,715 (£1,028,519) and net profit of £411,470 (£431,783). The ordinary dividend is repeated at 10 per cent.

BRIDGE OVER THE RIVER KARUN

OFFICIAL opening of the new £850,000 Pahlavi Foundation bridge at Khorramshahr, Southern Iran, is to be performed on March 1 by the Shah of Iran. The bridge, which spans the deep waters of the river Karun, links the island of Abadan with the mainland at Khorramshahr, one of Iran's major ports.

Designed and constructed by the Cementation Company, Limited, group for the Royal Estates of Iran, the bridge has an overall length of about 2,000 ft. and is longer than London's Westminster Bridge. Its five river spans total 828 ft. in length and its overall width is 34 ft. Construction is of steel and reinforced concrete and the bridge has been designed to take the heaviest type of traffic.

Work began in September, 1958, and was finally completed last month—eight months ahead of schedule. A total of 1,200 tons of structural steel, 375 tons of reinforcing steel, and 45,000 bags of cement were used in construction.

THE JAPANESE COMPANY Sumitomo Electric Industries, Limited, of Osaka, is to become a shareholder in the Dunlop subsidiary in Japan with a holding of almost 29 per cent. Dunlop Japan is to increase its issued share capital from 500,000,000 yen to 1,750,000,000 yen by the capitalization of reserves and the subscription in cash of 750,000,000 yen by Dunlop England and Sumitomo.

Company News

TUBE INVESTMENTS

£21,000,000 Share Issue for Expansion

RAISING of £21,000,000 by a rights offer of 16,828,702 £1 ordinary shares at 25s. each is announced by Tube Investments, Limited. It is one of the biggest industrial rights offers to be made in the United Kingdom. Reference to the "large expansion programme" being planned is made by the chairman, Sir Ivan A. R. Stedeford, in his letter to stockholders. Renounceable provisional allotment letters on a one-for-one basis will be posted on March 4 to holders of February 10.

The £21,000,000 from the issue is to be devoted to the increasing expenditure upon development, to creating additional capacity in the tube and electrical divisions, to a large new steel scheme, further oversea investment, and to supplying the extra working capital that is likely to be required to finance the steadily rising levels of production.

SIR IVAN STEDEFORD

It will be recalled that last December Sir Ivan Stedeford said that Tube Investments intended to press on as fast as it possibly could with its capital plans. Capital requirements for aluminium, it is intended, will be raised by those interests and the matter is now under consideration, says the chairman in his letter to stockholders. It is expected that the interim dividend for the year to July 31, 1960, will be maintained at 7½ per cent. on the existing capital, but the final of "not less than 8½ per cent." will be paid on the doubled capital. These rates of interim and final dividends, the chairman emphasizes, represent a total dividend of 12½ per cent. for the year on the increased capital.

Payment for the shares will be due as to 15s. by March 24 and 10s. by June 16. The issue will not be underwritten. Helbert Wagg & Company and J. Henry Schroder & Company will sell shares not taken up for the benefit of entitled shareholders. An extra-ordinary meeting will be held on March 1 to create more capital.

NICO LIGHT ENGINEERING COMPANY, LIMITED—The chairman, Mr. R. E. Green, has received a conditional offer for all the £54,125 capital of the company. Shareholders, who are advised not to sell their shares, will be written to shortly.

HALL ENGINEERING, LIMITED—Arrangements have been made for G. A. Harvey & Company (London), Limited, to take over the manufacture and sale of Milner steel office furniture, ward lockers, and office and factory partitioning.

THOMAS ROBINSON & SON, LIMITED, engineers and machine makers, of Rochdale—A final dividend of 10 per cent. (final of 7½ per cent. and bonus of 2½ per cent.) makes a total of 12½ per cent. (same) for 1959. Net profit was £80,061 (£71,467), after tax of £58,444 (£88,770).

MASON & BARRY, LIMITED, sulphur and copper mines, etc., of London, E.C.2—Dividends are being resumed with an interim of 12½ per cent. on account of 1959. This is the first payment since the 15 per cent. distributed for 1956. Last September, holders received a one-for-eight scrip issue.

MIDLAND ALUMINIUM, LIMITED—Funds are needed for general expansion and to finance increasing turnover and a one-for-one rights issue at 9s. per 5s. share is announced to raise £519,210 subject to expenses. The directors expect to maintain the 15 per cent. dividend rate on the increased capital.

W. TYZACK SONS & TURNER, LIMITED, sawmakers, etc., of Sheffield—A scrip issue of one ordinary share for every two held is announced. Dividend on the £1 preference shares is to be paid gross at 7½ per cent. less current rate of income tax, instead of 5¼ per cent. free from tax up to 6s. as at present.

BROMILOW & EDWARDS, LIMITED, engineers, of Bolton—Dividend is being raised from the equivalent of 11¼ per cent. to 15 per cent. for the year to November 30, 1959, on capital increased by a one-for-two scrip issue, with a final of 9 per cent. After tax of £127,483 (£99,787), net profit expanded from £95,481 to £140,398.

BRECKNELL, DOLMAN & ROGERS, LIMITED, manufacturers of wrapping and packing machinery, of Bristol—A one-for-one scrip issue to holders of March 11 is announced. The new shares will rank for dividend from October 1, 1959. An extra-ordinary meeting to create capital to effect the issue and to alter borrowing powers is called for March 11.

WEST CANADIAN COLLIERIES, LIMITED—The interim report states that results for 1959, as far as they are known and after taking account of income from investments and the realized profits on the sale of certain investments, allow the directors to hope for the distribution of a dividend, the amount of which will be proposed at the next annual meeting at the end of June.

JAMES H. LAMONT & COMPANY, LIMITED, engineers and brassfounders, of Edinburgh—A one-for-two scrip issue is proposed. The new shares will not rank for final dividend to be declared for 1959. The proposed

increase in ordinary capital, say the directors, does not imply any change in their existing policy of recommending dividends in accordance with market conditions and trading results.

STEETLEY COMPANY, LIMITED, manufacturers of refractories, of Worksop (Notts)—The dividend is again raised with a final of 10 per cent. to make 14 per cent. for 1959. Equivalent total for the previous year when there was a one-for-two scrip issue, was 11¼ per cent. compared with 10⅜ per cent. in 1957. Group profits rose from £2,014,004 to £2,430,613 and the net balance, after tax, from £956,500 to £1,250,619.

MARSHALL SONS & COMPANY, LIMITED, makers of diesel wheel and crawler tractors, etc., of Gainsborough (Lincs)—The chairman, Mr. Arnold Carr, states that it was not until the last quarter of the year that business began to show much improvement but it was now looking forward to a better trading position. The steel-foundry side was enjoying an increasing demand. Group net profits amounted to £54,463 (£60,663) and the dividend is maintained at 5 per cent.

BRITISH STEEL CONSTRUCTIONS (BIRMINGHAM), LIMITED—A net loss of £81,096 was sustained in the year ended August 29, 1959, compared with a profit of £7,948, after tax of £2,439 (£19,102). The dividend is again passed—the last payment was 17½ per cent. for 1953-54. Losses relating to previous period not included above were £35,237 (nil). Profits of £40,564 (£51,294) were earned by English subsidiaries before tax of £2,439 (£19,102). Losses in Canada were £119,221 (£24,056).

ASSOCIATED COAL & WHARF COMPANIES, LIMITED—Baring Bros. & Company, Limited, has made arrangements to place £750,000 5½ per cent. first mortgage debenture stock, 1980-85, of the companies at £97 per cent., payable as to £40 per cent. on February 24 and as to the balance on August 19. Application is being made to the council of the London Stock Exchange for permission to deal in, and for quotation for, the stock. It is expected that dealings will begin on Thursday.

FLETCHER HOUSTON & COMPANY, LIMITED, iron-founders, of Tipton (Staffs)—The company has acquired the whole of the issued ordinary and preference share capital of Baxters (Bolts, Screws & Rivets), Limited, Birmingham, together with its wholly owned subsidiaries A.1. Screw Company, Limited, and Automatic Feed Machines Company, Limited. Consideration was £423,975 in cash. The company's own resources with some temporary assistance from the bank financed the acquisition.

ALBERT MANN ENGINEERING COMPANY, LIMITED—A licensing agreement recently concluded with Loma Machine Manufacturing Company, Inc., and its subsidiary, Lobeck Casting Processes, Inc., of New York City, extends to the British Commonwealth (exclusive of Canada) and the Outer Seven countries and facilitates the supply of Loma and Lobeck metal processing equipment on a basis of British construction. Albert Mann has also taken over the capital of Roll Race Conveyors, Limited.

COLTNESS IRON COMPANY, LIMITED, engineers, makers of Portland cement, limestone, and building bricks, etc., of Glasgow—Group profits declined to £105,318 (£134,519) and the dividend for the year to September 30, 1959, is reduced to 11¼ (12½) per cent. Following omission of an interim, there is a single dividend of 9d. per 6s. 8d. share, against the previous total of 10d. After reduced tax of £52,429 (£78,611), the net balance is £52,889 (£55,908), of which £14,309 (£16,858) is retained by subsidiaries.

RATCLIFFS (GREAT BRIDGE), LIMITED, rolled metals manufacturers, of Tipton (Staffs)—Group net profit expanded from £236,561 to £294,976, after tax of £218,500 (£137,750). Net profit of the parent is £236,384, compared with £152,200. The 1959 ordinary dividend at 10 per cent. is being maintained with an unchanged final of 7½ per cent. Ordinary holders received a 33⅓ per cent. scrip issue last April in maximum 8 per cent. ordinary shares, so the current total payment represents an effective increase of 2⅔ per cent. to ordinary holders.

HENRY SIMON (HOLDINGS), LIMITED, milling and handling engineers, of Stockport—A special distribution of 6d. per 5s. ordinary share is declared out of realized capital profits, payable March 31 to holders registered February 22. This will not be taken into account in fixing whatever final dividend may be declared for 1959. The directors add that even though a similar distribution, of 4½d. per share, from capital profits was made a year ago, it should not be inferred that this payment will be repeated at any time in the future. Interim dividend for 1959, paid last month, was raised from 7½ per cent. to 10 per cent. A final of 12½ per cent. was paid for 1958.

CASTINGS, LIMITED—Neville Industrial Securities, Limited, announces a heavy demand for the placing of the ordinary shares of 2s. each at 3s. 1½d. The shares placed were made available only to members, who on January 25, 1960, were registered as holders of 50 or more ordinary shares in Neville Developments, Limited, as follows:—Applicants holding 100 ordinary shares or more in Neville Developments receive 80 ordinary shares in Castings, Limited, for every complete 100 ordinary shares held by them in Neville Developments; applicants holding 50 ordinary shares in Neville Developments participate in a ballot for allocations of 40 ordinary shares in Castings.

JONAS WOODHEAD & SONS, LIMITED, vehicle suspension specialists, of Leeds—Mr. M. Moore, chairman of the holding company, says that the general outlook is more encouraging. The company's aggregate turnover in this country is running at record levels and orders in hand for most products are excellent. He adds that certain prices which have proved unremunerative have been raised. This may bring about a loss of a certain amount of business, but is a calculated risk which the directors feel bound to take. There are welcome signs of improvement in the South African position. The company's financial year end is to be changed from September 30 to March 31. The next accounts will be for the six months ending March 31, 1960.

Another Record for ECSC Pig-iron

OUTPUT of crude steel (ingots and castings) in the European Coal and Steel Community, at 5,896,000 metric tons in January, fell just short of last October's record level, according to provisional figures published by the Joint Statistics Office of the European Communities.

The figure is considerably higher than the December total of 5,620,000 tons and more than 1,000,000 tons above the 4,814,000 tons produced in January of last year.

Output of pig-iron and ferro-alloys in January reached the record level of 4,416,000 tons, against 4,245,000 tons in December and 3,606,000 tons in January, 1959. The previous record output was 4,315,000 tons in October, 1959.

IRON AND STEEL TRADE

RESERVING criticism of the terms of settlement of the railway wages dispute, which are no more than temporary first-aid pending the issue of the Guillebaud report, the steel industry can breathe a sigh of relief that the rail services continue without interruption. So also does the steady rise in crude and rolled steel production continue without interruption as more and more projects for the building of works and factory extensions approach maturity. The danger—if danger there be—is that capital investment will outpace the physical resources of the industry, and it is probably this apprehension which has inspired the extensive re-stocking of steel products now in progress.

Pig-iron

Pig-iron consumption is on a rising scale. Little change is discernible in the requirements of the iron-foundries, which can be readily satisfied by the makers of high-phosphorus grades, but the steel plants are taking up very largely increased tonnages of hot metal from the blast furnaces and have also drawn upon stocks of pig-iron, which have been reduced by 20 per cent. in the last six months.

These reserves, however, still exceeded 1,200,000 tons at the end of December so that there is no immediate likelihood of a shortage, but there is no doubt that the blast furnaces engaged in the manufacture of basic iron are working under extreme pressure.

Ferro-alloys

The demand for ferro-tungsten remains at a steady level and the price is unchanged again this week. There is a fair call on ferro-vanadium, while ferro-molybdenum is quite active. Both the 45 per cent. Si and 75 per cent. Si grades of ferro-silicon continue to move at an interesting level and ferro-chrome is reasonably active. Calcium silicide is in fair request, and there is a good demand for silico manganese and ferro-manganese.

Ferro-niobium is well supported. Interest in ferro-titanium is also maintained. Steady attention is given to chromium metal, but silicon metal is a somewhat quieter feature.

Semi-finished Steel

There is no visible change in the semi-finished steel trade. The full output of billets, blooms, and slabs is readily absorbed and these products are excluded from the list of price changes authorized a fortnight ago. The relationship between production and consumption appears to be fairly evenly balanced. With increased capacity at its disposal the British steel industry has taken over the responsibility of providing for all home consumers' requirements without resort to the former heavy imports from the Benelux countries.

Occasional shortages are reported, but, on the whole, the re-rollers are able to secure the extra tonnages needed to cover their accelerated activities.

Finished Steel

Apart from the rail trade, which, according to the Iron and Steel Board, has shrunk by nearly 50 per cent. since 1957, and the continued decline in ship-builders' specifications, there are no dull spots in the market for finished steel products. Most impressive is the remarkable advance in the sales of heavy steel products such as beams, joists, and sections. The steel industry itself expects to spend an extra £50,000,000 on capital works this year, and in this manner is a substantial contributor to the increased demands made upon the rolling mills.

Builders and constructional engineers have also been placing orders on a much increased scale, and there has been a very marked increase in the demands for plates as well as heavy joists and sections.

ECSC Benefits for 110,000 Workers

MORE than 110,000 workers in the European Coal and Steel Community have so far benefited from its readaptation scheme, according to figures released by the High Authority. Under the scheme, which provides for supplementary unemployment allowances and grants for retraining and rehousing, more than £28,000,000 has been contributed in equal parts by the High Authority and national governments to help workers in the Community's industries.

About £21,000,000 of this total has been used for workers in the coal industry. A total of 91,854 miners have benefited—54,265 in western Germany, 25,650 in Belgium, 6,654 in France, and 5,285 in Italy. At the beginning of the year there were 970,000 workers in the Community's coal industry compared with 1,088,000 at the beginning of 1953 when the Common Market for coal was created.

Most of the money spent to help steelworkers went to Italy where 13,650 benefited out of a Community total of 17,736. Since the Common Market for steel was established the number of workers in the industry has risen from 473,000 to 546,000.

IRON-ORE IMPORTS RISE IN NORTH-EAST

IMPORTS at Middlesbrough Dock during the first four weeks of the year were considerably higher than in the corresponding period last year. One big factor was the rise in iron-ore imports from 22,160 tons to 40,855 tons. Exports dropped from 36,442 tons to 25,268 tons, largely because of a fall of more than 7,000 tons in exports of iron and steel goods.

Iron-ore imports at Hartlepool Dock rose, too, during the period, by about 22,000 tons, and coal exports declined by more than 36,000 tons mostly in coastwise trade. The import-export total for the period dropped overall by 13,000 tons to 204,426 tons.

NEWMAN, HENDER & COMPANY, LIMITED—Major I. C. V. Smith has been appointed a director.

Coal Stocks Reflect Transport Bottleneck

BOTH coal output and output per manshift continue to rise in spite of the steadily declining labour strength. Total output at 4,111,400 tons is about 7 per cent. down on last year, but deep-mined output is narrowing the gap and is now only 4 per cent. less than in the comparable week of 1959.

In the week ended February 6 undistributed stocks dropped by nearly 400,000 tons to 34,302,000 tons and if the transport bottleneck could be eased, the decline would be much sharper. This is borne out, not only by the fall in distributed stocks, but also by total consumption, which is well above total output.

There were 627,100 wage-earners on colliery books on February 6, against 677,700 on February 7, 1959, the numbers engaged at the coal face being 240,000 and 263,400, respectively. Total absenteeism (all workers) in the week ended February 6, was 14.49 per cent., compared with 15.00 per cent. in the week ended February 7, 1959. Output at the face was 3.936 tons and overall 1.398 in the week ended February 6, compared with 3.755 and 1.369 in the week ended February 7, 1959.

The following table gives (in tons) the output of saleable mined coal by division in the week ended February 13, and the tonnage lost through all causes (holidays, disputes, and go-slows):—

Division.	Week ended February 13, 1960.		Week ended February 14, 1959.
	Total output.	Tonnage lost.	Total output.
Scottish	378,900	2,700	377,900
Northern (N & C)	247,900	100	270,900
Durham	471,200	—	483,400
North-Eastern ..	863,000	8,300	903,300
North-Western ..	278,300	1,400	296,900
East Midlands ..	923,500	300	952,900
West Midlands ..	295,400	12,800	332,500
South-Western ..	414,200	4,900	428,800
South-Eastern ..	30,000	4,000	34,000
Great Britain—			
Deep-mined coal ..	3,902,400	34,500	4,080,600
Other deep-mined (including licensed mines) ..	50,700	—	54,400
Open-cast coal ..	158,300	—	274,800
TOTAL ..	4,111,400	34,500	4,409,800

Scottish Lime and Limestone Association

CHAIRMAN of the Scottish Lime and Limestone Association for 1960 is Mr. J. Y. Lind (William Lind & Company, Limited, Elderslie, Renfrewshire), who was elected to office at the Association's annual general meeting. Vice-chairman is Mr. W. H. H. Beeton (Keir & Cawder, Limited, Kirkmichael).

The executive committee is:—Mr. A. C. Gordon (Northern Agricultural & Lime Company, Limited, Aberdeen); Mr. A. M. Faichney (Cults Lime, Limited, Springfield, Fife); Mr. E. M. Cleland (Bairds & Scottish Steel, Limited, Glasgow); Mr. R. H. Bathgate (W. T. Bathgate (Lime Works), Limited, Gorebridge, Midlothian); Mr. M. I. Macmillan (James Reid & Company (1947), Limited, Lugton, Ayrshire).

The association's secretaries and treasurers are Russell & Dunlop, 20, Castle Street, Edinburgh 2.

Merger of Ruhr Coal Agencies Rejected

HIGH AUTHORITY of the European Coal and Steel Community has rejected a demand by the Ruhr coal industry for permission to form a central selling agency. The three selling agencies now authorized had proposed amalgamation and the creation of an emergency fund (to be supported by excess output fines) for aiding the finance of colliery closures. The application was supported by the West German Mineworkers' Union.

In view of the change in the position of coal in the fuel and power market, the High Authority considers it undesirable that the present selling organizations of the Ruhr coal mines should disappear without replacement. It will therefore examine which of the institutions of the coal-mining companies appear to be capable—if necessary for a limited period—of resolving the structural crisis and which may be authorized in accordance with the aims and provisions of the ECSC Treaty.

ECSC coal output in January reached 20,171,000 metric tons, only a slight variation on the December figure of 20,080,000 tons, but more than 1,000,000 tons less than the 21,283,000 tons produced in January, 1959. In the early weeks of the year there was little change in the level of pithead stocks which at mid-January stood at just over 31,000,000 tons.

With the exception of Italy, which is estimated to have increased her coal output over the past year by 4,000 tons to 65,000 tons, all the Community countries have made cuts in production, West Germany by nearly 4 per cent., Belgium by over 9 per cent., France by 6.2 per cent., and the Netherlands by nearly 7 per cent.

70-Mile Chemical Pipeline Planned for ICI

A PIPELINE linking the Esso Petroleum Company, Limited, refinery at Fawley (Hants) and the new Severnside works (Glos) of Imperial Chemical Industries, Limited, is being planned. The 70-mile pipeline, the first of its kind in Britain, will be used for the direct supply of ethylene from the refinery to the chemical plant. It is expected to cost about £800,000.

The pipeline would be buried to a minimum depth of 2 ft. 6 in. and its route would cross several railways, roads, rivers, and canals. It would be of welded construction and fully protected against corrosion. Construction may begin towards the end of the year and be finished by the end of 1961.

To supply ethylene to the new Severnside works and to meet increasing demands for other feedstocks, the chemicals plant at the Fawley refinery is to be expanded, involving an additional capital investment of £5,500,000. Construction of this new plant, which will include another steam cracker, is expected to start soon and be finished by next year.

THE FRENCH steel concern Lorraine-Escaut announces that a new furnace and Martin unit at the company's Longwy plant, a new furnace at Thioville, and new installations to the Sedan tube plant are nearing completion. Last year the company produced 1,870,000 metric tons of raw steel, against 1,830,000 tons in 1958; tube output was 436,000 (380,000) tons.

THE COAL TRADE

NEWS that the rail strike threatened for last Monday would not take place came as a great relief to all sections of the coal industry. Much effort had been made in planning to keep supplies moving in the event of a strike, but it was obvious to all concerned that the position would have been chaotic. Demand for both industrial and domestic grades continues to be strong and supplies have been held up by snow in many parts.

SCOTLAND

Glasgow—A comprehensive plan was worked out by marketing authorities, industrial consumers, and house coal merchants to be adopted on Monday in the event of a rail strike, and although all parties concerned were convinced that the project would be successful and perhaps demonstrate that the coal industry is less dependent on the railways than imagined, there was understandable relief that the scheme did not need to be tried. The weather was the least propitious for such a test, because of widespread snow and storms beyond the Glasgow area. Accompanying frost made road transport difficult in places, while space-heating loads rose substantially, calling for increased supplies. Interruptions caused by a change in the method of delivery would have been unhelpful.

In the event, supplies of industrial grades were adequate, although particular grades were not always available. On occasion pearls, washed smalls, and dross had to be accepted instead of singles, while doubles and trebles were not plentiful. Coking coal requirements have expanded considerably since the lighting on Monday of a rebuilt battery of coke ovens at the Clyde Iron Works, capable of carbonizing 10,000 tons a week. This will help to reduce undistributed stocks, much of which consists of coking coal accumulated last year during the steel trade recession. The extra oven capacity is needed to support the expansion in iron production. Supplies of furnace and foundry grades of coke are meanwhile being maintained. House coal is a brisk trade, and deliveries of fresh wrought fuel to merchants include a substantial proportion of doubles and trebles. These appear more acceptable to householders than hitherto, and a good trade is passing in the 28-lb. packaged form. Anthracite nuts remain scarce, and other sorts are clearing readily.

Fife and Lothians—Cold weather in many districts has increased demands, while snow and frost have made the lifting of stocks unpleasant. Overall trade is brisker than for some time, and unsold NCB stocks are now moving. Export cargoes are showing an improvement on last year's.

ACCENT ON JUVENILES AT TRAINING PIT

JUVENILE face training would in future be the main feature of work at Kemball Training Centre, Fenton, near Stoke-on-Trent, said Mr. G. W. Royle, the West Midlands Divisional Coal Board head of industrial training, on Saturday. Mr. Royle, who was speaking at the annual dinner-dance organized by the centre's sports and social club, said there would no longer be adult face training there.

Afterwards Mr. Royle, a former instructor at the centre, made presentations to three retiring employees. They were Mr. G. Carter (38 years' continuous service), Mr. T. Alkin, an instructor for 11 years, and Mr. H. Millington, an instructor for eight years.

South Wales Ports' Traffic Revives

BOTH exports and imports through South Wales ports in the first four weeks of the year show a considerable improvement over a year ago. Arrivals of iron ore, at 343,005 (315,005) tons, contributed to expansion of imports to 911,145 tons, about 125,000 tons above the 1959 level.

Even coal, coke, and patent fuel exports were better than 1959 and, at 257,363 tons, were 32,000 tons up. Foreign destinations took 101,930 (99,237) tons. At 40,516 tons, tinplates were 7,000 tons better.

The 1960 tonnages through the seven ports (1959 figures in parentheses) were as follow:—Newport, 187,271 (194,111) tons; Cardiff, 205,281 (169,096) tons; Barry, 115,009 (114,486) tons; Port Talbot, 224,039 (179,482) tons; Swansea, 687,144 (580,106) tons; Penarth, 38,928 (36,580) tons; Lydney, 1,456 (1,736) tons.

The £83,000,000 Question

HEADING a supplement with a reproduction of a pound note overprinted with "The £83,000,000 Question" is likely to attract anyone's attention and the February issue of Ingot News, the Richard Thomas & Baldwins, Limited, house journal, is no exception. The group's total trading income for 1959 was £83,305,000 and where that went and what happened to the £10,239,000 manufacturing and trading profit is the £83,000,000 question the supplement sets out to answer.

For every pound of the trading income 11s. 6d. went on raw materials, 4s. 4d. on salaries, wages, etc., 1s. 9d. on all other costs such as gas, electricity, water, transport, etc., leaving 2s. 5d. manufacturing and trading profit. In the same terms 8d. of the profit went to taxation, 9d. to depreciation, 7d. to fixed assets replacement reserve; 2d. to net dividends paid to the Iron and Steel Holding and Realization Agency, the Government body which at present holds all the company's shares, and 3d. is retained in the business.

MINORITY HOLDINGS in Wolstenholme Bronze Powders, Limited, Bolton, has been acquired by the American Marietta Company, of Chicago, for the sole purpose of strengthening Wolstenholme's position on the American continent. Mr. D. O. Noel, president of the metals disintegrating division of American Marietta, which has acted as agents in the US for the British company for some 10 years, has been elected to the board as representative of the new shareholders, but the control, management, and policy of Wolstenholme in the UK will remain unaltered.

GEC Wins Big Orders for RTB and Colvilles

ORDERS for electrical equipment worth nearly £2,250,000 have been placed with the General Electric Company, Limited, Witton, Birmingham, by Richard Thomas & Baldwins, Limited, for its new Spencer Works at Llanwern, near Newport (Mon).

The contract embraces the main drives for the finishing train of the 68-in. hot strip mill, which will be capable of rolling steel strip at 3,250 ft./min. It will be one of the most powerful mills of its kind in the world. Five of the six stands will be driven by d.c. motors each of 8,000 h.p., and the sixth by a 7,000 h.p. motor. Grid-controlled mercury arc rectifying plant, totalling in output 37.6 mW, will convert the 33-kV incoming supply to 1,500 V d.c. for the main motors.

GEC is also supplying a considerable amount of ancillary plant for the hot strip mill including electric drives and equipment for the run-out tables and hot strip coilers, as well as the complete electrical equipment for two single-stand temper mills in the cold rolling department. All the equipment will be delivered, erected, and commissioned in time for full production from the steelworks in October, 1961.

A further contract valued at £2,000,000 for power plant and electrical equipment has also been placed with the GEC by Colvilles, Limited. The plant and equipment is for extensions to the power house at Ravenscraig. Included in the contract are two turbo-generators, one of 20-mW, 30-mVA, and one of 12-mW, 28-mVA capacity; a turbo-blower rated 90,000 c.f.m., 40 p.s.i.g.; a 200,000-lb./hr. gas-fired boiler; feed heaters, condensers, and ancillary plant; and all the motors, switchgear, transformers, and cabling for auxiliary services. Also being supplied are two 30-mVA, 33/11-kV transformers and the necessary 33-kV and 11-kV switchgear.

The GEC will also manufacture a 19-panel 33-kV switchboard for a new sub-station taking a supply from the South of Scotland Electricity Board's 275 kV grid. This switchgear will be linked to the power station through two 30-mVA reactors which, together with all the associated 33-kV cabling for the sub-station, will also be by GEC. The General Electric Company was responsible for the complete power house associated with the first stage of the Ravenscraig project which went into operation in the summer of 1957. The extensions now in hand will meet the requirements for the second stage development of the works.

RAILWAY WAGON MAKERS PLAN MERGER

MERGER between two of Britain's biggest railway wagon and carriage manufacturers is being negotiated. They are Charles Roberts & Company, Limited, Wakefield, and the Birmingham Railway Carriage & Wagon Company, Limited. The directors said in a joint statement that a further announcement would be made "in due course." The amalgamation would create a group with total assets of almost £10,000,000.

It is expected that the merger will be accomplished by an offer from Charles Roberts, the larger of the two firms, for the capital of the other. Both companies have recently reported falls in orders at home and oversea.

Scots Face Challenge at Ravenscraig

NEW challenges to Scottish workers will be presented by the new Ravenscraig steel strip mill of Colvilles, Limited. Mr. R. P. Towndrow, a director of the company, said last week that out of the 1,500 new men who would have to be taken on, only 200 production workers would be involved in processes familiar in Scotland.

He foresaw a large education programme for the staff, and added that 200 engineering craftsmen would be maintaining plant unfamiliar to them and that supervisors and inspectors would be dealing with hitherto unknown processes. "The remaining production workers will be operating plant and dealing with techniques which they don't know about from experience," he said.

Mr. Towndrow was speaking at a meeting of the Industrial Panel of the Scottish Film Council. After films of other steel strip mills were shown, Mr. R. H. McNab, of the Scottish Council (Development and Industry), described some uses for strip steel from Ravenscraig. He said: "All the developments in the last 12 months are not necessarily attributable to the fact that we are going to have a strip mill. We do feel, however, that we are getting fairly close to the target rate of supplying jobs, but there is absolutely no room for complacency."

Port Talbot Project for Larger Ore Carriers

NEWS of "discussions of a preliminary nature" which have been going on between the British Transport Commission and the Steel Company of Wales, Limited, on the possibility of Port Talbot being extended to take larger iron-ore carriers has not been allowed to pass without comment. The cost of the project is likely to be between £50,000,000 and £60,000,000.

Forecasting that Cardiff and Barry interests might join with Swansea in opposing any plan to develop Port Talbot, Mr. James Callaghan, MP, stated last Friday that a searching public inquiry should be made into the proposals. In view of the huge cost experts should examine the possibility of discharging iron ore at Cardiff.

A spokesman for the Iron and Steel Board said that it was not for the board to say how the company was to solve the problem of ore imports, but solve it it must if the expansion programme was to go forward.

Water-Tube Boilermakers' Association Agreement

IN the case of an agreement between members of the Water-Tube Boilermakers' Association, Mr. W. A. Bagnall, for the Registrar of Restrictive Trading Agreements, in the Restrictive Practices Court on Monday, reminded the court that it had held that the agreement was not contrary to the public interest. The main order had been made and the court was now being asked to make a subsidiary order in respect of minor restrictions which had been held over.

The Registrar agreed that they were reasonably necessary for carrying into effect the principal restrictions upon which the court had found in favour of the association.

Personal

NCB Sales Promotion and Development Post

A NEW National Coal Board post—that of deputy director-general, marketing department—is to be filled in a few weeks' time by Mr. JAMES SINCLAIR WILLIAMS, at present director and chief executive officer of the Coal Utilization Council. Mr. Williams will have special responsibility for sales promotion and development.

MR. J. S. WILLIAMS

Born on April 27, 1910, Mr. Williams was educated at King's College School, Wimbledon, George Watson's College, Edinburgh, and Edinburgh University, where he graduated Bachelor of Commerce. During the first six years of his career he was one of the original group of six responsible for forming British Industries House, London. He joined the CUC in 1936 as personal assistant to the director, was appointed its secretary the following year, and director (deputy to the director-general) in 1949. In 1955 he was appointed director and chief executive officer on the resignation of the director-general—this latter title then being allowed to lapse.

During the war Mr. Williams was Joint Secretary of the Government's Fuel Efficiency Committee. He is an associate of the Institute of Fuel and was chairman of the Coal Industry Society in 1949-50. He is at present Chairman of the International Group on the Domestic Use of Solid Fuel. Mr. Williams was made OBE in the 1957 New Year Honours.

Mr. W. F. LIST, assistant managing director of C. C. Wakefield & Company, Limited, and of Wakefield-Dick Industrial Oils, Limited, has completed 50 years with the Wakefield Castrol group.

Mr. E. J. HILL has been returned unopposed as general secretary of the Boilermakers' Society. It will be his last term of office before retirement and this gives him a record of 30 years in office unopposed.

Mr. ALEX. CHRISTIE has retired after more than 50 years' service with Douglas Fraser & Sons, Limited (now Giddings & Lewis-Fraser, Limited), engineers, of Arbroath. For the past 26 years he has been machine-shop foreman.

Sir HAROLD SMITH, who retired as chairman of the Gas Council at the end of last year, has been appointed chairman of Gas Publications, Limited. Sir Harold was recently appointed chairman of the Milford Docks Company, Limited.

Mr. J. MACKENZIE-MAIR has joined the board of the Steel, Peech & Tozer branch of the United Steel Companies, Limited, and assumes the title of director and commercial manager. Mr. W. T. VIZER HARMER remains a full-time director of Steel, Peech & Tozer.

Mr. R. N. M. WARD, who has been with the Guest, Keen Iron & Steel Company, Limited, for over eight years, has joined the staff of the company's London manager, Mr. Victor Harvey. Mr. Ward's previous experience with the company was gained at Dowlais and Cardiff.

Mr. J. F. GROSS, chairman of the Marine Engineers' Benevolent Fund since its inception in 1929, has retired. At a celebration luncheon in London, presentations were made to him on behalf of the trustees of the fund by the new chairman, Mr. P. A. Brown.

Mr. FERGUS MCNEILL, manager of Harworth, Ollerton, and Bevercotes collieries (Yorks), is leaving for India at the end of March to become assistant chief mining engineer with Shaw Wallace & Company, Limited. Mr. McNeill, who is 36, has spent all his working life in the industry.

Mr. CHARLES D. GILL, chairman of the Spencer Wire Company, Limited, of Wakefield, will leave for Australia on March 2 to attend the congress in Canberra of the Federation of Commonwealth and British Empire Chambers of Commerce, of which he is chairman. He will be away for about four months.

Sir RICHARD YEABSLEY, who is chairman of Brown Bros., Limited, metal stockholders, etc., of London, E.C.2, and a director of Johnson & Phillips, Limited, manufacturing electrical engineers, etc., of London, S.E.7, and many other companies, has joined the board of Spicers, Limited, paper makers, and has been elected chairman.

Mr. H. O. HALLAS, Middle East zone manager of Perkins Engines, Limited, left the UK on Monday on a business tour of Turkey, Egypt, the Lebanon, Amman, Cyprus, and Greece, where more than 50,000 Perkins diesel engines are working in vehicles, boats, agricultural and industrial equipment. Mr. Hallas plans to return on April 1.

Managing director of W. Tyzack Sons & Turner, Limited, Col. W. S. TYZACK has been elected president of Sheffield Lighter Trades Employers' Association. He succeeds Mr. D. J. HAGGIE, a former director and chairman of Spear & Jackson, Limited. Mr. A. H. PLEWS, managing director of Slack, Sellars & Company, Limited, is the new vice-president.

Mr. J. O. BLAIR-CUNYNGHAME has joined the board of the Provincial Insurance Company, Limited. Last September it was announced that, because of his desire to return to his native Scotland, Mr. Blair - Cunynghame would be resigning his position as staff member of the NCB at the end of the year.

MR. J. O. BLAIR-CUNYNGHAME

He succeeded Sir Andrew Bryan on the Coal Board in 1957 after two years' service with the board. He was the first to hold the post of director-general of the staff department, an office set up on the recommendation of the Fleck Committee. His first appointment on leaving the NCB was that of an ordinary director of the Royal Bank of Scotland.

A director of the District Bank, Limited, since 1939, Mr. RICHARD F. SUMMERS has been appointed deputy chairman. Mr. Summers is chairman of John Summers & Sons, Limited, steelmakers, of Shotton (Ches), and its subsidiaries, president of the British Iron and Steel

Federation, and a director of the Steetley Company, Limited, and its subsidiaries, and of the United Steel Companies, Limited.

Mr. L. C. RICHARDS, until recently chief engineer of the transformer division of Associated Electrical Industries, Limited, at Manchester, has become chief engineer to Heavy Electricals, Limited, the Indian Government company building the heavy electrical plant manufacturing centre at Bhopal. Mr. Richards is seconded to this position from AEI Overseas, Limited, to which company he has been transferred.

Sir JOHN BROCKLEBANK has accepted the invitation of the council of the Institute of Shipping and Forwarding Agents to become the institute's president as from the next annual general meeting to be held on May 4. Sir John, who is chairman of the Cunard Steam-Ship Company, Limited, is also chairman of Chas. Howson & Company, Limited, the Liverpool engineers, and a director of a number of other companies.

Mr. LESLIE F. CHAMBERLAIN, chairman of the Chamberlain Consolidated, Limited, group of companies which includes Chamberlain Industries, Limited, makers of cranes, excavators, bending machines, etc., of London, E.10, is to visit Trinidad to sound the market for manufacturing and marketing standard steel buildings in the Caribbean. He will be accompanied by Mr. M. H. Briggs, of Sanders & Forster, Limited, the structural engineering company in the group.

The two annual prizes awarded by the Institution of Works Managers to the best students who have completed the institution's two-year course have been won by Mr. H. J. WYATT, project engineer in the engineering design department of Imperial Chemical Industries, Limited, and Mr. W. HUDDLESTON, a member of the technical staff of the Springfields Atomic Energy Plant, Salwick, near Preston. Mr. Wyatt receives the Fildes award and Mr. Huddleston the Ellis memorial award.

Mr. WILLIAM P. WALKER, managing director of William Denny & Bros., Limited, shipbuilders, of Dumbarton, has resigned to become managing director of Brown Bros. & Company, Limited, hydraulic engineers, of Edinburgh. Mr. Walker has been a member of the board of this company for several years and has been closely associated with it in the development and improvement of the Denny-Brown stabilizer. He will remain a non-executive director of Denny's.

A retired foreman at the Scunthorpe works of the Appleby-Frodingham Steel Company (branch of the United Steel Companies, Limited), is, at the age of 68, returning to the steel industry—in Spain. Mr. WILLIAM H. COOK, who retired a year ago, has accepted a post in charge of a wash-heating plant at a new steelworks in Spain where two former colleagues, Mr. CHARLES POGSON and Mr. E. BURGESS are employed. Mr. Cook spent 41 years in the section mills at Scunthorpe, first as leading heater and then, for the last 20 years, as foreman.

Prof. Sir GEOFFREY TAYLOR, FRS, formerly Yarrow Research Professor of the Royal Society, was presented with the Kelvin gold medal for 1959 at the Institution of Civil Engineers in London on Tuesday. The award is made triennially as a mark of distinction in engineering work or investigation of the kinds with which Lord Kelvin was especially identified. Prof. A. J. S. Pipard, FRS, said that Sir Geoffrey's work in meteorology and aerodynamics and his many contributions to hydrodynamics, elasticity, the behaviour of crystals under strain, plastic flow in metals, and the mathematics of viscous and compressible fluids had firmly established his reputation as one of the greatest of applied mathematicians and mechanicians.

Coal Stocks Position

DETAILS of coal stocks as at February 6, 1960, compared with those available at February 7, 1959, are given in the appended table issued by the Ministry of Power.

Figures in parentheses, mainly calculated on the basis of requirements during the winter, indicate the total weeks which the tonnage in stock would last.

Week ended:—	Feb. 6, 1960.	Feb. 7, 1959.
	Thous. tons.	Thous. tons.
Distributed stocks—		
Public-utility undertakings—		
Gas	1,951 (3.7)	2,399 (4.5)
Electricity	5,593 (5.0)	6,434 (6.1)
Railways	463 (2.3)	636 (3.0)
Coke ovens	1,301 (2.5)	1,316 (2.7)
Industrial consumers—*		
Iron and steel	215 (1.9)	229 (2.0)
Engineering and other metal industries	282 (3.1)	301 (3.3)
Other industries	1,584 (2.8)	1,791 (3.2)
TOTAL INDUSTRIES	2,081	2,321
Merchants' stocks—		
(*a*) House coal	1,026	1,131
(*b*) Anthracite and boiler fuel	157	106
Miscellaneous (estimated)	296	373
TOTAL DISTRIBUTED STOCKS	12,868	14,716
Undistributed stocks—		
At collieries (on ground and in wagons)	27,644	13,978
At open-cast sites	6,658	5,743
TOTAL UNDISTRIBUTED STOCKS	34,302	19,721

* Excluding stocks held by the smaller consumers of less than 1,000 tons per annum.

Carrying Men in Coal Tubs Criticized

PRACTICE of carrying men to work underground in tubs also used for carrying coal was deprecated by Mr. T. Holliday, president of the Northumberland Area of the NUM, at the inquest at Ashington into the death of Mr. Thomas Mason (63), a miner at Newbiggin Colliery.

Recording a verdict of Accidental Death, the coroner, Mr. R. A. Percy, said Mr. Mason was killed when a set of tubs got out of control. The men riding on the tubs had had a nightmare experience which they would never forget. A chain link, which previously seemed to be in good condition, had snapped and he had been assured that tougher material would be used in future.

Criticizing the practice, Mr. Holliday said he was glad to know that it was to be stopped. He added that the visual examination of dirt-covered chain links and shackles was no examination at all.

MR. O. D. GWILLIAM has been appointed to the newly-created post of assistant general manager of Foster, Yates, & Thom, Limited, heavy precision engineers and boilermakers, of Blackburn.

The Scrap Markets

Resumption of Coastal Traffic

EVIDENCE of the growing strength of the scrap trade is provided by a noticeable increase in coastal traffic. Local supplies fall far short of steelworks' requirements and the search for material has to be made much further afield.

Cleveland—Suppliers no longer have any need to worry about foundry outlets for such materials as they have for disposal. There is an avid demand for all types of steel scrap and works are also taking up some of the surplus tonnages of good cast-iron scrap. The use of a larger proportion of pig-iron in the steel melting shops has become a matter of sheer necessity and, though scrap is much cheaper there is by no means sufficient to meet the demand.

Resumption of the arrival and discharge of scrap cargoes in the port of Tees is an indication of the state of the market. These tonnages all emanate from coastal ports since imports from oversea have ceased entirely.

Lancashire—Active trading conditions continue to be reported in virtually all sections of the markets. Merchants are experiencing a brisk demand from the steel mills for usable grades of melting scrap and a steady tonnage that is being made available is finding a ready outlet. Machinery metal in relatively good quantities continues to come on to the market.

Scotland—Very strong pressure for supplies of suitable scrap continues to be exerted by the steelmakers, who are keen to acquire even fuller deliveries than are at present forthcoming. Production of steel turnings remains fairly steady, while output of cast-iron borings is well up to average and all available supplies of this grade of scrap are being sent forward to the blast furnaces.

A slight improvement seems general in the position of the ironfoundries, some of which, anyway, have booked additional orders, but this has not yet been reflected in their scrap requirements. What business is being done is mainly in the lighter grades.

Midland Iron Holding Company Planned

SHAREHOLDERS of the Midland Iron & Hardware Company (Cradley Heath), Limited, have been invited to exchange their preference and ordinary stock in the company for preference and ordinary stock in a new holding company to be known as Midland Iron Group (Cradley Heath), Limited, with the same trading interests.

The exchange basis is one ordinary 1s. stock unit in the new company and 1s. cash, for one ordinary 1s. unit of the existing company, and one 7 per cent. cumulative 10s. preference unit in the new company and 6d. cash for one 5 per cent. cumulative 10s. preference unit of the existing company.

Apart from the increase in the rate of dividend on the preference and the proposed exchange involving the distribution of the company's surplus cash, holders will have the same interests in the new company as they now hold in the present company.

Ore Chartering

ALTHOUGH no particular volume of tonnage has been fixed from the Mediterranean area, including Spain, Portugal, etc., there is, however, quite a reasonable miscellaneous demand and in certain cases some contract business could be arranged with ore from North Africa to the Continent. There are also a few single cargoes quoting from North Africa to the Continent, with 24s. 6d. indicating from Benisaf to Ymuiden or Amsterdam, and offers are invited from Bizerta to Holland, option German discharge. Residues have been fixed from Porta Marghera to Rotterdam at 28s. 6d., f.i.o., for February/March loading and there is a fair demand for tonnage to load burnt ore from Spain to the Continent. Seville/London paid 41s., f.i.o., for 1,500 tons of barytes for middle February shipment. From North Spain, Pasajes/Tees has taken a 2,600-tonner for middle March at 29s., and two cargoes of burnt ore, February/March and March/April, have been fixed from Bilbao to Rotterdam or Dordrecht at 18s. 6d. and 18s. 9d., respectively, f.i.o. basis.

West African chartering reports Pepel to the Adriatic at 31s. 6d. March 5-21, for 9,500 tons, with prospects of further business and there appears to be rather more miscellaneous inquiry from this particular coast.

Pyrites reports the payment of 29s. for a 9,500-tonner, March 20/April 20 from Morphou Bay to Rotterdam, and similar size and similar rate for April 20/May 20 from Vassiliko Bay to Rotterdam.

The phosphate market generally appears to be rather quiet, with some demand to this side and to the Continent, Casablanca/Holland fixed 9,500 tons for March 1-15 at 20s.

Alcoa Cancels Canadian Aluminium Contract

DELIVERY by Aluminium, Limited, of Canada, of about 59,000 tons of aluminium to the Aluminum Company of America (Alcoa) during 1960 and 1961 has been cancelled against payment by Alcoa this year of $9,000,000. The cancelled quantity represents about 10 per cent. of the total quantity originally contracted for by Alcoa in 1953.

The chief factor behind the cancellation is the opening up in June of a 15,000 tons-a-year Alcoa smelter at Warrick, Indiana. The original contract was made when the domestic industry was pressed for metal because of the Korean emergency. Alcoa's domestic activities have already suffered to some extent because of the Canadian contract.

The Canadian company states that in view of its current sales prospects, the cancellation will not affect the recently-announced production schedule of 675,000 tons of aluminium from its Canadian smelters this year.

MR. KENNETH EDWARD SUMMERS, managing director of Kenneth Summers & Son, Limited, engineers, of Peterborough, has died at the age of 59. He was apprenticed to the Newall Engineering Company, Limited, and from 1922 to 1928 worked in the United States. On his return he rejoined the company at Enfield before moving to Peterborough to become works director, and then, in 1944, managing director. Four years later he founded his own business.

News in Brief

STEEL PRODUCTION in the United States this week is estimated by the American Iron and Steel Institute at 2,699,000 tons, compared with 2,687,000 tons last week and 2,449,000 tons a year ago.

FURNACE SLAG HEAPS in Poland, now about 37,000,000 metric tons, are causing concern to the country's metal-producing industry, in many cases preventing expansion. A campaign is, therefore, under way to use the slag as building material and in the production of cement.

EXCEPT WITH special official permission export of pig-iron, billets, all sheet metal, and scrap metal has been banned by Yugoslavia. Ferro-concrete steel grades, seamed tubes, and armatures are among goods which may now be exported from the country on a contingent basis.

A HALL CHAIR made in 1845 entirely of coal fetched £60 when it was auctioned at Sotheby's last Friday. The chair weighs 42 lb. and is believed to have been carved by an Ayrshire miner. It was on the list of articles Hitler ordered should be taken to Germany when England was overrun.

BECAUSE OF "burdensome changes" introduced into the proposed contract, the Phoenix Steel Corporation, of New York, has rejected the offer by the Metallurgical Equipment Export Company, Limited, London, S.W.1, to finance and build a new steel plant on the Delaware River, New Jersey.

GREATLY OPPOSED as it is to the present plan of the Ruhr coal-mining industry for a new marketing system the High Authority of the European Coal and Steel Community is thought likely to be ready to agree to a further year's extension of the present coal sales set-up should the producers request it.

PLANS FOR A NEW £1,000,000 factory at Crompton Way, halfway betwen Bury and Bolton, are announced by the directors of Walmsley (Bury) Group, Limited, manufacturers of pulp and paper-making machinery, etc. Negotiations are in progress for the purchase of a 75-acre site, owned by Bolton Corporation.

ARBROATH TOWN COUNCIL has given planning permission for the erection of a factory for the Metal Box Company, Limited. The factory, which will cost £250,000 and will employ about 100 workers in the initial stages, will come into operation in January, 1961. Output target is over 1,000,000 cans a week.

MR. KHRUSCHEV toured the steelworks at Bhilai, Rajasthan, on Sunday as part of his short visit to India. The works was built by Russian credit and Russian technicians and plant and is working towards a maximum output of 1.000.000 tons a year. This output is to be increased by Russian credit to 2,500,000 tons.

THE ALPINE-MONTANGESELLSCHAFT concern of Austria has received an order for a briquette press for dust coal for a plant at Rtanj in the Yugoslav state of Serbia. Capacity of the plant is from 5 to 9 metric tons of briquettes per hour. This is the second order for such plant the company has received from Yugoslavia.

COMPLETE FINISHING LINE equipment for the heavy plate mill at the new Dunkirk steelworks of the Société Dunkerquoise de Sidérurgie is to be supplied by Schloemann AG, Düsseldorf. Included in the order are all the shears, material-handling and transfer devices, piling and testing equipment, the cooling beds, and a hot levelling machine.

A COMPUTER capable of storing up to 10,000,000 characters of information has been ordered from IBM United Kingdom, Limited, by Dorman Long (Steel), Limited, for its mill order office at the Lackenby steelworks. The machine, which is the first of its kind to be ordered in Great Britain, stores the information in the form of magnetized spots.

A SERIES OF PRICE CHANGES has been announced by Italian steel manufacturers. The Cogne concern has raised prices of thick sheet and medium sheet by 5.6 per cent. and for fine sheet by 6 per cent., while Ceretti has increased its price for steel bars of under 80 mm. by 1.4 per cent. and dropped that for bars of 80 mm. and above by 4 per cent. The Società Metallurgica Italiana has reduced its rolled wire prices by 3.9 per cent.

ALTHOUGH THE Federal German refined steel industry is at present working full out by virtue of a very lively demand from home consumers, the future holds problems for it. Speaking in Düsseldorf, Dr. Barich of the Stahlwerke Südwestfalen, AG, said that export turnover for the industry was very unsatisfactory and that, even on the home market, the pressure of foreign competition was being felt. Imports had risen by 20 per cent. in the past few months alone.

A NEW STAFF CANTEEN was opened last week at the Orb Works of the Steel Company of Wales, Limited, at Newport (Mon). Bright colours have been extensively used to give the canteen a gay, warm, and comfortable atmosphere. The single-storey building provides dining accommodation for both staff and operatives and is also used for the preparation of food which is sent to sub-canteens in the works. The staff dining hall, which gives accommodation for 128 diners, is also equipped with a first-class stage and can be quickly converted into a theatre.

Northern Ireland Seeks Cuts in Coal Transport

NORTHERN Ireland may import more coal from the developing Scottish fields, according to a report last weekend by the Northern Ireland Domestic Coal Liaison Committee. The report adds that imports from Lancashire and Northumberland are being increased.

At present about 2,800,000 tons of coal are imported every year into Northern Ireland mainly from the east Midlands. The committee has been trying to find alternative sources to reduce transport costs. Three months ago, Cumberland and Scotland were discounted as immediate sources.

The new report says: "We have since reviewed the prospects in relation to Northumberland, Yorkshire, and Lancashire coalfields, but in each case there appear to be problems which effectively prevent a substantial increase in imports being likely from these areas. We have been pleased to learn, nevertheless, that it has recently proved possible to effect some increase in imports from Northumberland and Lancashire."

MINERS CLAIM 12s. A WEEK RISE

DEMAND for a 12s. a week pay increase for about 300,000 day-wagemen in the coal industry was submitted on Wednesday by the National Union of Mineworkers. The National Coal Board has promised to reply as soon as possible.

The board has also asked the union to reconsider its decision to take its claim for shorter hours to arbitration. It is understood that the board feels it would be better to discuss the two claims in relation to each other, rather than that one should be left to the independent judgment of the industry's tribunal.

Appointments

Personnel Director of ICI's Nobel Division

STAFF manager of the Nobel division of Imperial Chemical Industries, Limited, since 1957, Mr. ROBERT HASLAM, who is well known in mining and quarrying circles, has been appointed personnel director of the division.

MR. ROBERT HASLAM

After graduating with a B.Sc. in mining engineering at Birmingham University, Mr. Haslam gained practical experience in coal mining with Manchester Collieries, Limited, and subsequently with the National Coal Board. He gained his colliery manager's certificate and in 1947 joined the technical service department of ICI's Nobel division. While in that department he did much work in the development of pulsed infusion shotfiring.

Mr. Haslam was appointed an assistant manager of the division's technical service department in 1955 and staff manager two years later. He took up his new duties on February 1, but retains the responsibilities of staff manager.

Mr. B. A. CHENGAPA has been appointed assistant liaison executive in India for Perkins Engines, Limited.

Dr. DENIS REBBECK, deputy managing director of Harland & Wolff, Limited, has been appointed a Deputy Lieutenant of Belfast.

Mr. A. W. WAGSTAFF has been appointed secretary of Whessoe, Limited, Darlington, in succession to Mr. T. Heslop, who retires later this year after holding the post since 1938. Mr. Heslop will remain a director of the company.

Mr. THOMAS HAINING, works manager of Washington Steel Foundries, Limited (Co. Durham), has been appointed general manager of F. Turnbull & Company (Engineers), Limited, Newcastle-upon-Tyne. He assumes his new post next month.

University lecturers appointed by Cambridge University for three years from October 1 next include Dr. J. D. C. MCCONNELL, of Fitzwilliam House, as Lecturer in Mineralogy and Petrology, and Dr. J. C. R. TURNER, of Trinity College, as Lecturer in Chemical Engineering.

Mr. EDWARD TATE, assistant sales manager of Coalite & Chemical Products, Limited ("Coalite" division), has been appointed by the National Carbonising Company, Limited, to the position of sales manager for "Rexco" smokeless coal. He joins his new company on March 1.

Following the recent death of Mr. K. B. McCreddie, sales manager, Mr. R. S. LANE, who joined the company in 1946, has been appointed commercial manager of Henley Foundries, Limited. The new sales manager is Mr. C. M. GRANT, who joined W. T. Henley's Telegraph Works Company, Limited (the parent company of Henley Foundries), in 1938. After war service Mr. Grant returned to the company's engineering sales department and was appointed representative to Henley Foundries in 1953.

Mr. B. HOWARD WILLIAMS has been appointed a director of Foundry Services Australia Pty., Limited, the Australian company of Foundry Services International, Limited, Birmingham. Mr. Williams joined the Foseco organization in 1951 and in 1958 went to Australia as general manager of the Australian company. Mr. ROBERT W. FLINT has been appointed general manager of the associated Indian company, Greaves Foundry Services Private, Limited. He joined the Foseco organization in 1950.

Mr. KENNETH BAIRD, personnel manager of F. Perkins, Limited, the Peterborough diesel engine makers, has been appointed manager of the company's newly constituted personnel and industrial relations division. Mr. Baird was formerly personnel and training officer with Rotax, Limited, aircraft electrical engineers, of London, N.W.10. Assistant manager of the new department will be Mr. KEITH GERRARD, formerly deputy general manager of the company's personnel division. He joined the company in 1949 as a supervisor in the personnel department.

Mr. E. M. WHITAKER has joined Associated Electrical Industries (Woolwich), Limited, as assistant to the commercial director, Mr. J. W. Ridgeway. Mr. Whitaker, who will be located at 155, Charing Cross Road, London, W.C.2, joined the British Thomson-Houston Company, Limited, at Rugby in 1931 as a school apprentice; in 1932 he went to Leeds University for a three-year degree course in electrical engineering and then rejoined BTH as a student apprentice. From 1937 to 1942 he was in the industrial motor sales department as a commercial engineer. Mr. Whitaker returned to BTH after war service and became assistant manager of the company's Buenos Aires office early in 1947. From 1951 to 1953 he was regional representative of the BTH Export Company in Colombia, Venezuela, Trinidad, and British Guiana, and from 1954 to 1956 he was manager of the Buenos Aires office. He then joined AEI Overseas, Limited, in London, and in 1958 became personal assistant to Lord Chandos, the AEI chairman.

Triplex Foundry Proposes Rights Issue

RIGHTS issue of 800,000 ordinary shares of 5s. at 10s. per share in the proportion of one-for-one to those on the register on February 1 is proposed by Triplex Foundry, Limited. Any dividends declared for the year to March 31, 1960, will be outside the scope of these new shares.

The directors expect that profits before tax for that year will be not less than £150,000 and they expect to recommend a further dividend of 7½ per cent., making 12½ per cent. for the year. A total of 7½ per cent. was paid for the year to March 31, 1959.

For the year ending March 31, 1961, a full year's profit will be included from the newly-acquired subsidiary, Vowles Bros., Limited. There will also be a large saving in interest charges and the directors state it is reasonable to expect an appreciable increase in the group's profits if the present rate of profit earning of all sections is maintained. The directors would, in this event, feel justified in recommending a dividend for that year of not less than 12½ per cent. on the ordinary share capital as increased by the rights issue.

Board Changes

New Chairman for Henley Foundries

AN executive director of Associated Electrical Industries, Limited, Dr. J. N. Aldington, has been appointed a director of HENLEY FOUNDRIES, LIMITED, Cradley Heath (Staffs), and elected chairman of the board.

Dr. Aldington is group managing director of AEI (Woolwich), Limited, a director of AEI Export, Limited, and of a number of other AEI subsidiary companies at home and oversea. He is also a director of the Siemens & General Electric Railway Signal Company, Limited (owned jointly with the General Electric Company, Limited), and chairman of Submarine Cables, Limited (owned jointly with the Telegraph Construction & Maintenance Company, Limited). Dr. Aldington is a member of the council of the British Electrical and Allied Manufacturers' Association.

MASON & BARRY, LIMITED—Mr. C. Whitely has been appointed a director.

AVELING-BARFORD, LIMITED—Mr. T. H. B. Whiting has been appointed a director.

FRANCIS SHAW & COMPANY, LIMITED—Mr. T. H. Wood and Mr. C. B. Drover have been appointed directors.

HENRY BRIGGS SON & COMPANY (TRUST), LIMITED—Mr. Geoffrey Edwards has resigned from the board owing to pressure of other commitments and overlapping interests.

INTERNATIONAL NICKEL COMPANY OF CANADA, LIMITED—Mr. W. C. Bolenius, executive vice-president of the American Telephone & Telegraph Company, has been elected a director.

DRAG SCRAPER & CONVEYOR COMPANY, LIMITED—Mr. H. F. H. Shields has relinquished the managing directorship of the company, and Mr. M. Clayton has been appointed to succeed him.

PECO MACHINERY SALES (WESTMINSTER), LIMITED—Mr. E. L. Tuff has been appointed a director and deputy chairman of the company, which is a subsidiary of the Projectile & Engineering Company, Limited.

WILMOT-BREEDEN, LIMITED—Mr. R. S. Odd is leaving his appointment as a director and general manager of the company to become joint managing director of Lansing Bagnall, Limited, Basingstoke, on April 1.

BRITISH ROPEWAY ENGINEERING COMPANY, LIMITED—Mr. H. F. H. Shields has accepted the position of honorary president of the company, relinquishing the chairmanship to Mr. G. F. B. Harvey, joint managing director.

WANDLESIDE WARREN WIRE, LIMITED—Mr. W. L. Stephens, head of Stephens & Walkington, the Belfast firm of shipping agents, has joined the board of the company, which is an associate of Falk, Stadelmann & Company, Limited.

METAL INDUSTRIES, LIMITED—Mr. Wilfred Padley has been appointed to the board. He will relinquish his position as managing director of Brookhirst Igranic, Limited, a subsidiary, and will be succeeded in that appointment by Mr. A. B. Vickery.

C. & L. HILL, LIMITED—Mr. E. J. Boag, previously works manager of the Phosphor Bronze Company, Limited, has been appointed a director and general manager of the company and its subsidiaries. Mr. W. A. Bannister has been appointed sales director and Mr. L. E. Morris continues as works director. The company is a member of the Rubery Owen group.

IMPERIAL CHEMICAL INDUSTRIES, LIMITED—Mr. J. L. S. Steel is retiring from the board on March 24. He has been with ICI for more than 37 years and a director since 1945. In recent years he has been responsible for the company's economic planning, with particular interest in Common Market and Free Trade Area. In 1954, Mr. Steel was appointed chairman of a small panel composed of leading industrialists which was formed by the British Standards Institution to advise the institution on how it could best assist export trade.

WILLIAMS & WILLIAMS, LIMITED—The chairman, Mr. B. A. Williams, has been appointed president of the company. Mr. T. Sarl-Williams and Capt. J. Fox-Williams, managing directors, have been appointed vice-presidents. Mr. S. R. Hogg is the new chairman, and other members of the board are Mr. J. K. Vivian, Mr. J. H. W. Margetts, Mr. T. Wayman Hales, and Sir Gerald Wills, MP. The board reconstitution follows the announcement after the annual meeting that the directors had been considering rationalizing the company's activities.

Aluminium Research Scholarship Planned

A RESEARCH scholarship in the application of aluminium in mechanical engineering is to be awarded this year by the council of the Institution of Mechanical Engineers, provided there are suitable candidates. The scholarship, which is being given by the Aluminium Development Association, is worth £650 a year and will be tenable for two years with the possibility of a third-year extension.

Candidates, who must be British-born subjects, should normally be at least 23 years old, and must have obtained an approved engineering degree or have satisfied the institution's examination requirements for graduate membership by some other means. They should preferably have had at least 18 months' practical training in works.

Application forms and a copy of the conditions of award may be obtained from the secretary of the institution, 1, Birdcage Walk, London, S.W.1. Completed application forms should be returned by May 11.

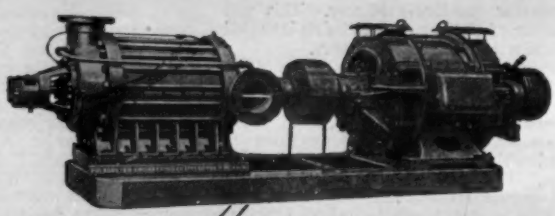
Second Highest Coal Exports from Wales

SHIPMENTS of coal and coke from the South Wales ports last week represented the second highest weekly total of the year. The total of 67,178 tons was 11,988 tons higher than in the corresponding week of last year and 11,131 tons more than the previous week's total. The year's best total to date was 80,611 tons in the last week of January.

Newport's total of 15,635 tons was the port's highest since the week ended October 19, 1958, when 15,924 tons were loaded.

Exports from the various ports, including foreign and coastwise cargoes, during the week ended February 14, 1960 (with totals for the week ended February 13, 1959, in brackets) were:—Newport, 15,635 (6,621) tons; Cardiff, 7,385 (4,991) tons; Penarth, 4,704 (9,047) tons; Barry, 19,232 (12,050) tons; Port Talbot, 1,442 (1,106) tons; Swansea, 18,780 (21,375) tons.

Turbine
Pumps
Famous for
Reliability and High Efficiency



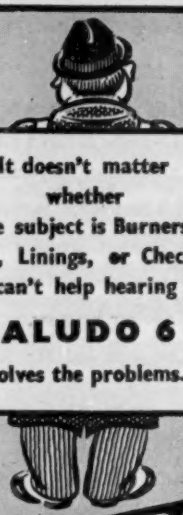
For All Duties
All Heads

List No. 3034

Turbine Symbol

The Pulsometer
Turbine Pumps

Pulsometer Engineering Co. Ltd.
Nine Elms Ironworks, Reading.



It doesn't matter
whether
the subject is Burners,
Roofs, Linings, or Checkers
you can't help hearing how
ALUDO 6
solves the problems.

A CERAMIC HOLDINGS SUBSIDIARY

JAMES DOUGALL AND SONS LIMITED
ESTD. 1884
Firebrick Manufacturers
BONNYBRIDGE SCOTLAND

Orders Placed

SIMON-LOBNITZ, LIMITED, Renfrew, has received an order for a non-propelled cutter suction dredger from the John Holt Westminster Dredging Company, Limited.

HEAVY PLANT DIVISION of Associated Electrical Industries, Limited, has received an order from the tinplate division of the Steel Company of Wales, Limited, for germanium rectifiers. The order is worth more than £200,000.

THREE NEWSPAPER CONVEYORS for the Rouen newspaper, Paris-Normandie, have ordered from Brookhirst Igranic, Limited, a company in the Metal Industries group. The company has also secured an order for eight conveyors for the Daily Mirror. This will raise to 32 the number of BHI conveyors being installed in the newspaper's new London headquarters.

THE WORLD'S BIGGEST single unit distillation plant has been ordered by Compania Shell de Venezuela from Buckley & Taylor, Limited, Oldham. The plant is capable of producing 1,200,000 gallons of fresh water daily from sea water—enough for a town of 25,000 people—and will be installed at the Cardon oil refinery, Venezuela. The order is worth £250,000.

ORDER FOR 281 vertical and horizontal engines has been received by Ruston & Hornsby, Limited, Lincoln, from its Bankok agents. The engines will be used to provide power for rice-milling, ice production, and the production of electricity in Thailand. The company has also received an order from the city council at Suva, in the Fiji Islands for two engines to power the new municipal power station.

ORDER TO BUILD an ore-preparation plant worth more than £300,000 for the Sierra Leone Development Company, Limited, has been received by the Woodall-Duckham Construction Company, Limited, London, S.W.3. The plant will be built at Marampa and will be capable of dealing with 110 tons of crude iron ore per hour. Constructional work will begin next September and be completed by June, 1961.

ORDER WORTH about £800,000 for 10 generating sets of 3,000 kW for the power station at Tema Harbour, Ghana, has been received by Mirrlees, Bickerton & Day, Limited, Stockport, a member of the Hawker Siddeley Group. The engines embodied in these sets are the company's KVSS16 type developing 4,159 bhp at 428 rpm. Brush Electrical Engineering Company, Limited, Loughborough, will supply the alternators.

ORDER FOR VALVES worth £50,000 for the Athens water system has been received by Cockburns, Limited, Glasgow. The order, which has been in negotiation for some months, was won against competition from continental and American firms. The valves are from 4 ft. to 6 ft. in diameter and made in mechanite iron with special rubber seats. They are based on US designs which the company manufactures under licence.

OVERHEAD ELECTRIC travelling cranes have been ordered from the Wharton Crane & Hoist Company, Limited, Reddish, Stockport, by Richard Thomas & Baldwins, Limited, for its new steel rolling mill at Llanwern, near Newport (Mon). The order is worth more than £300,000. The cranes are of various types with capacities in the 10-ton to 75-ton range. Deliveries will begin next September and continue until April, 1961.

ORDERS FOR BRITISH-BUILT Howard Rotavators, worth more than $750,000 (about £269,000), have been received from North America by Rotary Hoes, Limited, West Horndon (Essex). The orders were placed at a recent farm equipment convention in the Middle West. In the USA, Rotary Hoes operates its own company, Howard Rotavators, Inc., in partnership with Starline, Inc., farm equipment makers, of Harvard.

EQUIPMENT FOR a blast-furnace gas cleaning plant has been ordered by Richard Thomas & Baldwins, Limited, from Lodge-Cottrell, Limited, Birmingham. The contract is worth £720,000 and is the largest single order ever secured by the company. The plant is for the new RTB Spencer Works at Newport (Mon) and comprises gas-cooling and scrubbing towers, electrostatic precipitators, and water-clarifying and filtration and dust-recovery plants.

TWO ORDERS FOR 19 miles of wire rope for use in timber operations in the Philippines have been received by Frew Bros. & Company, Limited, Whifflet (Lanarkshire). The ropes, ranging in size from 1¼ in. to 3½ in. in circumference, will play a vital part in the extraction of valuable timber, including mahogany, from the large forests. The orders, paid for in dollars and worth several thousand pounds, will be ready for shipment at the beginning of March.

REPEAT ORDER WORTH £120,000 for three 6,000 cub. ft. per minute electrically driven centrifugal air compressors has been awarded by the National Coal Board to Daniel Adamson & Company, Limited, Dukinfield (Ches). The machines will be of the "Adamson/Escher-Wyss" type and are to be complete with all electrical equipment including driving motors, safety devices, water cooling plant, and pumping plant. They will be installed at Wolstanton Colliery, Stoke-on-Trent.

CONTRACTS FOR LARGE-CAPACITY centrifugal cargo oil pumps for three 77,000-ton-d.w. tankers have been received by Hayward Tyler & Company, Limited, Luton, a member of the Stone-Platt Industries group. The tankers are to be built by A. G. "Weser" for the Esso group. International Combustion, Limited, has also placed a contract with Hayward Tyler for the supply of heat exchanger glandless circulating pumps for the nuclear power station to be built at Trawsfynnyd, north Wales, for the Central Electricity Generating Board.

LARGE-SCALE PLANT FOR MACHINING BERYLLIUM

NEW plant for machining beryllium, the first large-scale works of its kind in the country and possibly in Europe, will be opened in Coventry next week by Sir W. G. Armstrong Whitworth Aircraft, Limited, a member of the Hawker Siddeley Group, Limited. Beryllium has been chosen as a canning material for fuel elements in a new advanced gas-cooled reactor at Windscale and the plant will produce components for the latest type of nuclear reactors.

Elaborate measures have been taken against the hazards of beryllium dust and Mr. Robert Courtman, chairman of the company's projects committee, states that it has been found necessary to spend about £3 on employee protection for £1 on normal manufacturing facilities.

Wellingborough Blast Furnace Relit

A BLAST furnace which has been idle since the recession in 1957 was relit at the works of the Wellingborough Iron Company, Limited, on Monday. The first metal was tapped the following day and the weekly production from the works will be raised to 5,000 tons.

Seventy extra men have already been added to the works' labour force of 300 and more are wanted.

Electrical Aids in Industry *Data Sheet* **No. 11**

Dielectric Heating - 2

The ability of dielectric heating to generate heat through the mass of a suitable material provides the following considerable advantages over other heating methods.

1. A body of uniform section and composition is heated uniformly throughout. Hence there is no waiting for heat to be conducted to the centre of the body, and this is of particular advantage when the body is thick, and, as is often the case with dielectric materials, has poor heat-conducting properties.

2. The rate of heating can be faster than by external heating methods.

3. Since there is no external heat source, overheating or burning of the surface of a heat-sensitive material is avoided.

4. Heat input and heating time can be positively controlled.

5. High thermal efficiency is achieved.

6. Production can start immediately after switching on, and no current is used, nor heat lost, during periods of shut-down.

7. Vastly increased productivity is obtainable with less labour (usually unskilled), and fewer machines and less floor space are required.

8. Dielectric heating provides flexibility of layout and can be inserted directly in the production line.

Dielectric Heating: typical application data

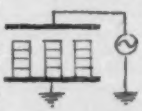
Typical application	Frequency	Radio frequency power
Thermoplastic welding.	20–100 Mc.p.s.	Up to 1 kW
Plastic preheating, wood glueing.	10–40 Mc.p.s.	2–30 kW
Plywood manufacture.	2–10 Mc.p.s.	Above 30 kW

Note: 1 Mc.p.s. = 1,000,000 cycles per second.

A few of the industrial applications of dielectric heating are briefly described below.

Preheating Thermosetting Plastics

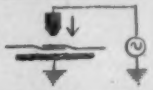
Dielectric heating is ideal for preheating pellets used for thermosetting plastic mouldings, which are poor heat conductors. It promotes faster curing, reduces moulding time and can increase production 10 to 15 times. Tool wear and damage to metal inserts are reduced, and thicker sections can be moulded.



Welding of Thermoplastic Materials

An important and extensive application of dielectric heating is the welding of thermoplastic sheets in the fabrication of such commonly used articles as raincoats, hoods, handbags, pouches and packaging materials. Dielectric heating is the only method which can usefully be employed, since the heating electrodes, and hence the outside sheet surfaces, remain cool while the inside surfaces forming the joint are fused, and a perfect weld results.

Two or more thermoplastic sheets are welded under pressure from electrodes suitably shaped to the area of weld required, the current being switched on at the same time as pressure is applied, and off when the weld is completed and the pressure released. Stitching is thus eliminated and a far stronger joint achieved.



In some cases, a suitably profiled electrode can be fitted with a knife edge to cut the sheets immediately outside the weld line, welding and pattern-cutting being thereby carried out in the one operation. Dielectric welding can be applied also to very large thermoplastic products such as linings for swimming pools, and cinema screens.

Drying

Drying of materials by dielectric heating has the great advantage that the material tends to dry out from the centre, the reverse of what happens when external heating methods are employed, and the risk of overdrying and overheating of the surface is eliminated. While the removal of large amounts of water from inexpensive commodities may sometimes be uneconomical, dielectric heating in the production line often leads to a higher overall production efficiency. It is valuable for removing final moisture traces and becomes increasingly economical as the value of heat-sensitivity of the commodity increases.

For further information get in touch with your Electricity Board or write direct to the Electrical Development Association, 2 Savoy Hill, London, W.C.2. Telephone: TEMple Bar 9434.

Excellent reference books on electricity and productivity (8/6 each, or 9/- post free) are available — "Induction and Dielectric Heating" is an example.

E.D.A. also have available on free loan in the United Kingdom a series of films on the industrial uses of electricity. Ask for a catalogue.

6774-4

Coalfield News

Personal Safety Messages for Yorkshire Miners

PERSONAL messages about safety in Yorkshire pits have been posted to the county's 130,000 miners and 7,000 junior officials. They come from the North-Eastern Divisional Coal Industry Consultative Council, with the suggested slogan: "I have a responsibility for my own safety." The messages recall that last year 68 miners were killed in Yorkshire pits —an increase of 25 over the 1958 figure.

"It is most disturbing," the messages continue. "A total of 33 of the accidents was due to falls of ground —13 more than in 1958. Half of all the accidents from falls of ground could have been avoided." There were 10 deaths last year from three gas explosions. This is the first time that personal letters on safety have been posted to miners.

ACCOUNTS OF THE Creswell Colliery Disaster Relief Fund for 1959 show that allowances paid in the year totalled £11,265. The total paid since the inauguration of the fund stands at £116,493. There is a balance of £105,263. Allowances paid in 1960 are expected to cost the fund about £11,000.

STRIKE OF 1,100 miners at Water Haigh Colliery, Oulton, near Leeds, ended on Monday while union officials considered their grievance. The strike began on Friday night over the suspension of the union branch delegate, Mr. Bob Wilkinson, who was alleged to have been found with a tin of matches at his working place underground.

FORTY-THREE HAULAGE HANDS at Denaby Main Colliery (Yorks) who had been on strike since February 10 returned to work on Monday. They had claimed that two men were having to do the work of three in the Barnsley Seam. When they struck a further 90 workers of all grades were affected. The stoppage cost 1,300 tons of coal.

DERWENTHAUGH COAL SHIPPING staith on the south bank of the Tyne is to close, the Durham Divisional Coal Board confirmed on Tuesday. A statement will shortly be made giving the closure date and arrangements for absorbing staff and men becoming redundant. The staith comprises one loading berth of two gravity spouts and has been shipping about 20,000 tons of coal weekly. Reductions in the Tyne's coal shipments have led to the closure for economy reasons. The coal from Derwenthaugh will be diverted to other staiths on the Tyne.

"Management Holds Future of Coal Industry"

FUTURE of the coal industry is in the hands of the management, North Staffordshire members of the National Association of Colliery Overmen, Deputies, and Shotfirers were told on Saturday. The speaker, Mr. H. J. Widdowson, North Staffs Area general manager of the West Midlands Divisional Coal Board, said: "As far as I am concerned you are the salt of the earth and the most important link between the board and the men."

Mr. Widdowson, who was speaking at Stoke, declared that increased productivity and the operation of new techniques would be in their hands.

Coal Chartering

GENERALLY speaking, the American trades are quiet and this includes the movement of grain. Again there has been no improvement to record in the demand for tonnage to load coal from Hampton Roads, and business to the Continent is really only workable subject to stem and owners agreeing to charterers' ideas. There are one or two possible re-let cargoes. The only real interest in the American coal trade at the moment is to Japan; a 14,000-tonner for March 25/April 25 has been fixed at $8.50 and a part-cargo of 4,000 tons to Yawata for March paid $8.25. Interest is maintained, although today there is not quite the same pressure to fix. Hampton Roads/Dublin fixed 11,000 tons for end February at $4.25.

There is a rather better demand from the UK for West Italian discharge and a 4,000-tonner has been fixed from Wales to Malta for end of February at 25s. On the other hand, there is some shortage of stems for the very early loading positions. Coasting tonnage is in demand for French discharging ports, but there is not a great deal quoting for other continental areas.

Gdynia or Gdansk to Chittagong fixed 9,500 tons for March at 54s. and a small cargo of 3,000 tons Szczecin/Lisbon at 27s.

There is also some demand from the Continent with fertilizers, but there is no appreciable inquiry for the large carriers.

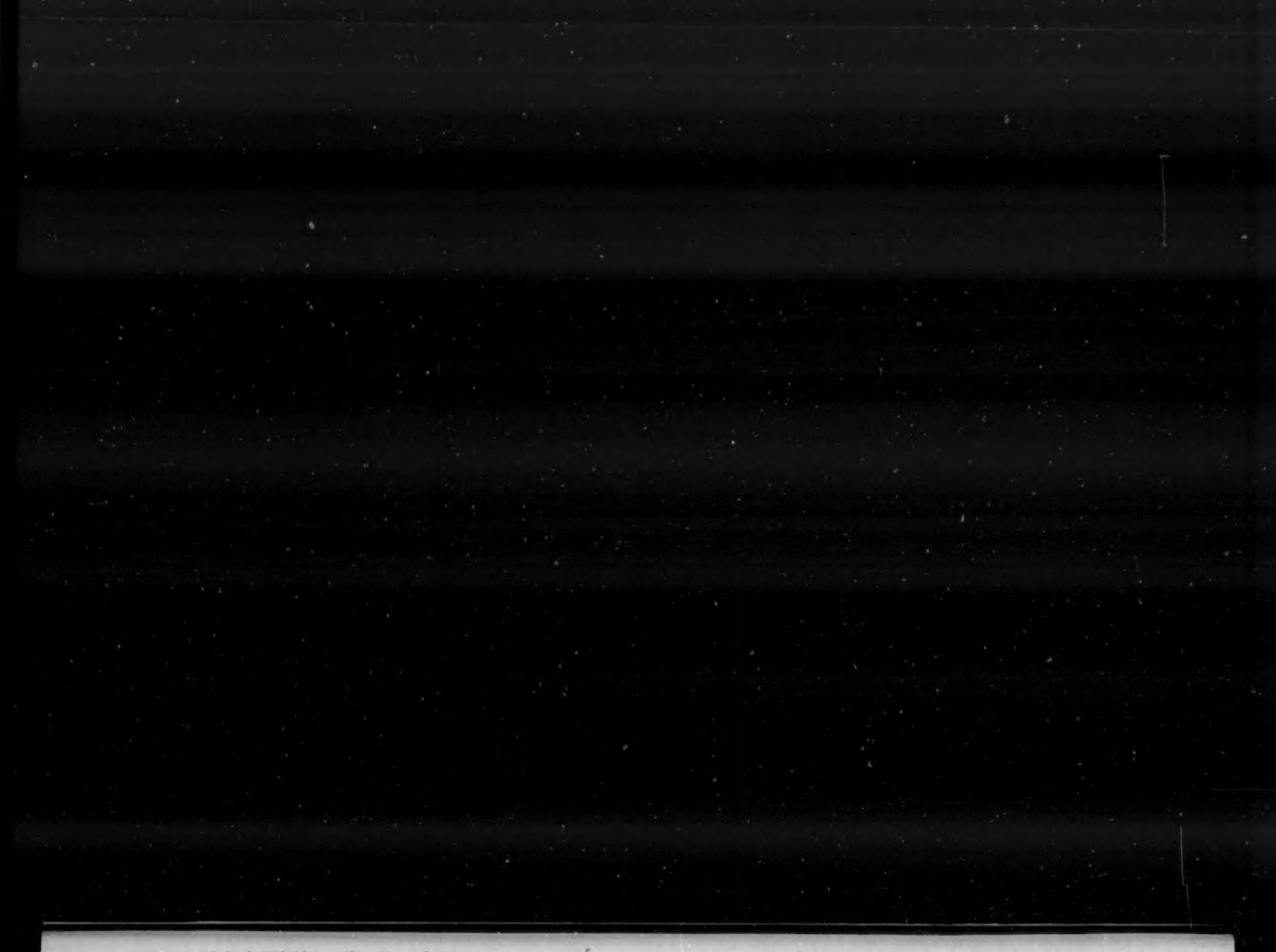
"Line Closure Would Hit Mineral Traffic"

OPPONENTS of the proposal by British Railways to close the cross-Pennine line from Penrith to Barnard Castle will argue at a public hearing in Carlisle on Wednesday that the large mineral traffic on the line earns an overall annual income of £1,000,000. This will be their answer to the BR claim that about £100,000 a year would be saved by the closure.

The traffic includes limestone and lime from Pennine quarries to the ironworks of the north-east, coke from east to west, and a considerable carriage of coal. The objectors' reply to the BR promise to re-route the minerals is likely to be that this would take much longer. In a recent re-routing experiment by BR in this area, some wagons took as long as two weeks to reach their destination. At present a wagon of lime from the quarries can reach Middlesbrough, 40 miles away, in about five hours.

Brake Puzzle at Inquest on Colliery Platelayer

EVIDENCE about the application of a brake on two railway wagons, which was given at a Stoke-on-Trent inquest on Monday, failed to solve the problem of why Mr. John Thomas Blundred (57) met his death. Mr. Blundred, who was a platelayer at Florence Colliery, Longton (Staffs), was crushed between two coupled wagons and a single wagon.

Mr. William John Aston, brakesman, gave evidence of applying the brake on one of the coupled wagons, but neither he nor other witnesses knew how it came to be released so that the coupled wagons bumped into the single wagon.

The jury returned a verdict of Accidental Death.